"COMPARISON OF 0.1 % BUPIVACAINE AND 2 mcg / ml FENTANYL WITH 0.1 % ROPIVACAINE AND 2 mcg/ ml FENTANYL FOR LABOUR ANALGESIA"

Dissertation submitted to
The Tamil Nadu Dr.M.G.R. Medical University
Chennai – 600032.
In partial fulfilment of the regulations for the Degree of

M.D.ANAESTHESIOLOGY
BRANCH – X

Under the guidance of
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DEPARTMENT OF ANAESTHESIOLOGY
K.A.P.VISWANATHAM GOVT. MEDICAL COLLEGE, TRICHY.

APRIL - 2017

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This is to certify that this dissertation titled **"Comparison of 0.1 % Bupivacaine and 2 mcg /ml Fentanyl with 0.1 % Ropivacaine and 2 mcg /ml Fentanyl for Labour analgesia "** is a bonafide work of **Dr.S.DEVASENA**, Post Graduate in M.D.Anaesthesiology, **Department of Anaesthesiology, K.A.P.V. Government Medical College, Trichy** and has been prepared by her under our guidance. This has been submitted in partial fulfilment of regulations of The Tamil Nadu Dr. M.G.R. Medical University, Chennai -32 for the award of M.D. Degree in Anaesthesiology.

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LIST OF ABBREVIATIONS USED

(In alphabetical order)

ASA	-	American Society of Anaesthesiologist
bpm	-	Beats per minute
cm	-	Centimetre
CSF	-	Cerebrospinal fluid
CTG	-	Cardiotocography
DBP	-	Diastolic blood pressure
ECG	-	Electrocardiography
HR	-	Heart rate
ICP	-	Intracranial pressure
Kg	-	Kilogram
LA	-	Local anaesthetic
LMW	-	Low molecular weight
LOR	-	Loss of resistance
MAP	-	Mean arterial pressure

Mcg	-	microgram
Min	-	Minute
mmHg	-	Millimeter of mercury
NIBP	-	Non invasive blood pressure
OG	-	Obstetrics & Gynaecology
%	-	Percentage
Spo2	-	Pulseoxymetry
SBP	-	Systolic blood pressure
Sec	-	Seconds
%	-	Percentage
Vd	-	Volume of distribution

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Introduction

INTRODUCTION

The labour pain is considered as the most painful experience a women endures in her lifetime. An array of pharmacological and non pharmacological techniques have been used to alleviate the labour pain.

THE DELIVERY OF THE NEWBORN INTO THE ARMS OF A CONSCIOUS AND PAIN FREE MOTHER IS ONE OF THE MOST EXCITING AND REWARDING MOMENTS IN MEDICINE

- MOIR

In 1930 to 1940, regional techniques were occasionally used in labour analgesia. Routinely high doses of scopolamine and morphine were used. Also supplementations with inhalationals like ether, chloroform, trichloroethylene and nitrous oxide were used. As it was associated with complete loss of consciousness patients were unable to participate at time of delivery which resulted in poor patient satisfaction. Also side effects like maternal aspiration, fetal and neonatal depression were common.

Central neuraxial analgesia is the gold standard technique for obstetric analgesia and anaesthesia. Patient satisfaction of birth experience was greater with neuraxial technique. Epidural blockade is an effective means of providing analgesia during labour.

Charecteristics of an Ideal Labour Analgesia

1. Effective pain relief.
2. Safe.
3. Minimal effects on progress and outcome of labour.
4. Minimal effects on fetus or newborn.
5. Minimal maternal side effects

History

HISTORY

James Young Simpson was the first to use ether in labour analgesia.

In 1853, John Snow acted as an anaesthetist at the birth Prince Leopold and Princess Beatrice by administering chloroform for safe confinement of eighth child of Queen Victoria. He gave his royal patient 15 minimum doses of chloroform intermittently on a handkerchief which lasted for 53 min.

In 1898, August Bier performed first spinal anaesthesia in humans.

In 1900, Oscar kreis, performed total anaesthesia of the lower part of the body in six parturients following subarachnoid block with cocaine.

The first caudal anaesthesia was described by Siccard and Cathleen.

In 1909, Walter Stocker performed caudal epidural analgesia for 141 labouring parturients with Inj. Procaine at the end of first stage and second stage of labour.

In 1921, Pages first described Lumbar epidural anaesthesia in human.

In 1930, Dogliotti first performed the loss of resistance technique.

In 1931, Eugen Bogden Aburel first placed epidural catheter into the caudal space.

In 1933, Ruiz and Gutieruez performed hanging drop sign for identifying epidural space.

In 1941, Hingson performed first continuous caudal for obstetrics.

In 1947, Cuberlo performed first lumbar epidural catheterisation for surgery.

In 1957, Bupivacaine was first synthesised.

In 1960, lumbar replaced caudal anaesthesia.

In 1962, Lee first introduced closed catheter tip with lateral holes into the epidural space to reduce trauma.

In 1979, Behar used epidural morphine analgesia.

In 1980, opiods was first used in labour analgesia.

In 1988, Gambling performed first patient controlled epidural analgesia.

In 1993, Morgan introduced combined spinal epidural analgesia for labour.

In 1996, Ropivacaine was first synthesised

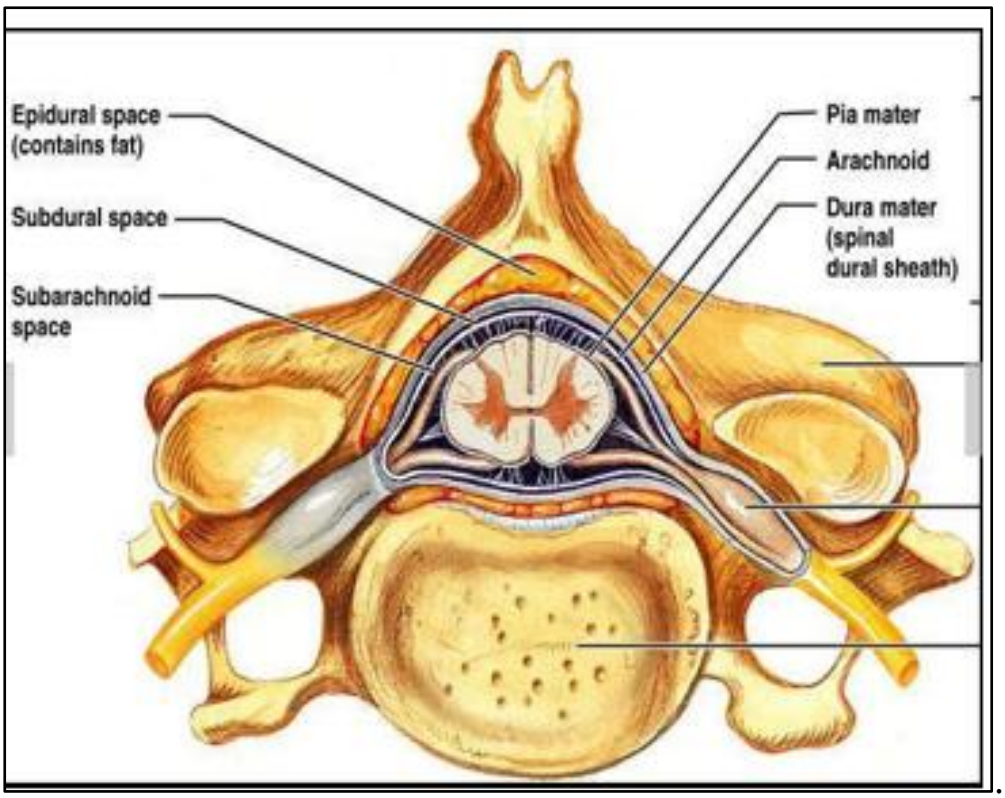
EPIDURAL SPACE

The epidural space lies between dura and ligamentum flavum. The space extends from foramen magnum to sacral hiatus. Its boundaries are

Anterior – Posterior longitudinal ligament

Lateral – Pedicles and intervertebral foramen

Posterior – Ligamentum flavum



Contents:

1. Nerve roots
2. Epidural fat

3. Areolar tissue
4. Lymphatics
5. Blood vessels
6. Batsons venous plexus

Measurement of Epidural Space

LEVEL	MEASUREMENT
C7 – T1	0.4 mm
UPPER THORACIC	7.5 mm
T11-12	4.1 mm
LUMBAR	4-7 mm

Pressure in Epidural Space

Epidural space is a potential space which is under negative pressure of -1 to -7 cm of water except at sacral region. The negative pressure is more in sitting position rather than in lateral decubitus position.

Physiology of Central Neuraxial Blockade

Central neuraxial blockade results in autonomic, sensory and motor blockade. The local anaesthetic binds to the nerve roots and disrupts nerve signal transmission. The nerve roots and the dorsal root ganglia are the site of action.

Drug Distribution in Epidural Space:

The Local anaesthetic deposited in the epidural space

1. Cross dura and enter subarachnoid space
2. Longitudinal spread – both rostral and caudal
3. Circumferential spread
4. Binding to epidural fat
5. Absorbed into vessels

Factors Enhancing Epidural Spread

- **Drug Factors**
    1. Volume and total mass of the local anaesthetic
- **Patient Factors**
    1. Increased Epidural space compliance
    2. Increased epidural pressure
    3. Decreased epidural fat

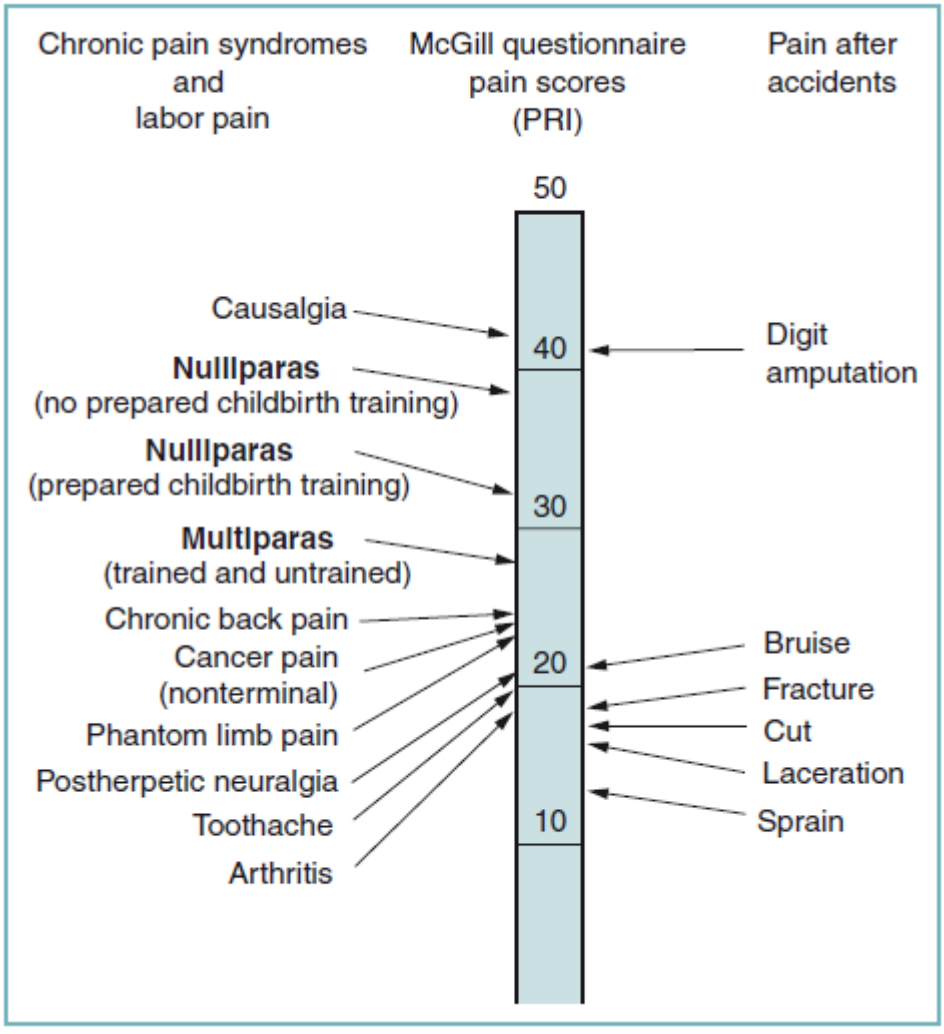
4. Decreased seepage through IV foramen

- **Procedural Factors**

1. Level of injection

LABOUR PAIN

The intensity of pain and suffering associated with labour and vaginal delivery varies among parturients. Mcgill pain questionnaire was used by Melzack and colleagues to measure pain during labour and delivery.



Nulliparous women generally had a higher pain rating index (PRI) when compared to parous women.

First Stage of Labour

The first stage labour pain originated from cervix and lower uterine segment. Dilation of cervix and the lower uterine segment resulted in tissue distention , tearing and stretching. The painful impulses from lower uterine segment and the cervix is transmitted through visceral afferent nerve fibres and enters the spinal cord at T10 , T11,T12 AND L1 spinal segments. The first stage labour pain is also transmitted to dermatomes supplied by the same spinal nerves which receives input from the uterus and cervix.

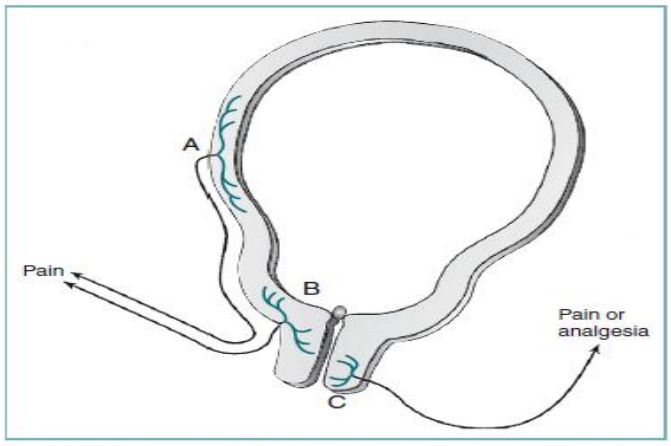


FIGURE 20-4 Uterocervical afferents activated during the first stage of labor. Uterine body afferents (A) partially regress during pregnancy and may contribute to the pain of the first stage of labor. However, the major input is from afferents in the lower uterine segment and endocervix (B). By contrast, at least in animals, the activation of afferents that innervate the vaginal surface of the cervix (C) result in analgesia, not pain, and they enter the spinal cord in sacral areas rather than at the site of referred pain in labor.

The visceral afferent fibres from the lower uterine segment and cervix terminate in the spinal cord in the ipsilateral superficial and deep dorsal horn and the ventral horn in a loose network of synapses as well as crossing the midline to the contralateral dorsal horn with multiple

rostrocaudal extensions. Hence the first stage labour pain is diffuse in nature than second stage labour pain.

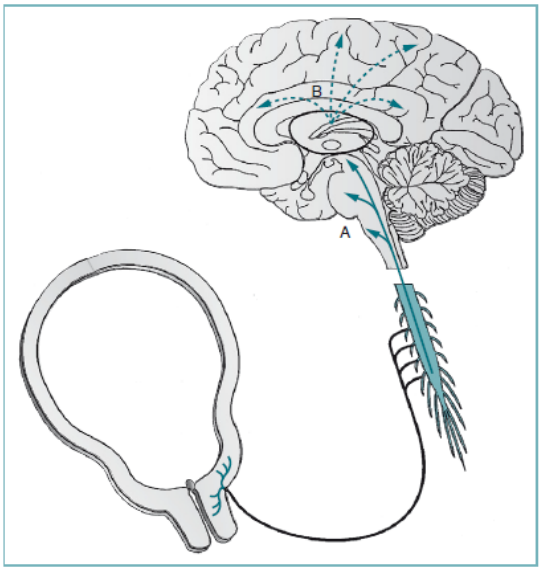


FIGURE 20-6 Supraspinal pain pathways activated by the pain of the first stage of labor. Ascending pathways project to the pons and the medulla (A), thereby activating centers of cardiorespiratory control and descending pathways as well as the thalamus (B), which in turn sends projections to anterior cingulate, motor, somatosensory, and limbic regions (*dotted lines*).

This forms the basis for treatment of labour pain using regional neuraxial techniques. The visceral pain of the first stage of labour pain can be blocked with either bilateral paracervical block or lumbar sympathetic blockade.

Second Stage of Labour

In the late first stage and second stage of labour pain due to full cervical dilation, the fetus descends the birthcanal and the pressure exerted by the fetus on the vagina and perineum are the additional sources of pain. The distention of the birth canal results in stretching and tearing of fascia and subcutaneous tissues and pressure on the skeletal muscles of the perineum. Somatic sensory impulses from the vagina and perineum

are transmitted through S1,S2 and S3 spinal segments which forms the pudendal nerve .The stimulation of the pain sensitive structures within the pelvic cavity and pressure on the lumbosacral segments produce aching and cramping discomfort in the thighs , legs and the lower back. The somatic afferent fibres terminate in the ipsilateral superficial laminae of the dorsal horn with little rostrocaudal extension. Thus the somatic pain due to descent of the fetus can be blocked by pudendal nerve block.

In addition physical factors like age of the parturient, parity, maternal condition, nature of cervix at the onset of labour ,the position and size of fetus in relation to the pelvis influence the duration and severity of pain during labour. The elderly nulliparous parturient experiences long duration and severe pain when compared to young nullipara. The parous women experience less pain compared to nullipara as the parous cervix begin to soften even before the start of true labour pain. The intensity of uterine contractions is higher in early stages in nulliparous whereas it is higher in late stages in parous women.

The psychological factors like anxiety, apprehension, fear of labour pain and the presence of birth companion also influence the intensity of labour pain.

Central neuraxial blockade provides complete analgesia for both first and second stage of labour.

Physiological Effects of Labour Pain on Parturient and Fetus

Labour pain stimulates respiratory centre and increase minute ventilation and increase oxygen consumption. Painful uterine contractions result in maternal hyperventilation and leads to respiratory alkalosis, a leftward shift of oxy-Hemoglobin dissociation curve and reduced oxygen delivery to the fetus. Hypocarbia leads to hypoventilation in between contractions which reduces maternal PaO2. A transient maternal and fetal hypoxemia occurs due to compensatory hypoventilation between contractions.

The stress pain during labour produces the activation of sympathetic nervous system which results in increase in plasma catecholamine concentrations and hence cardiac output and blood pressure. This increase in catecholamine is detrimental to uterine blood flow.

The uterine contractions produce auto transfusion leading to increased cardiac work. Contractions also decrease uteroplacental perfusion .

STAGES OF LABOUR

The first stage of labour starts with the onset of true labour pain to full cervical dilatation of 10 cms. The second stage of labour starts with full cervical dilation to delivery of the fetus. The third stage is from delivery of the newborn to complete expulsion of the placenta.

Friedman plotted a graph with cervical dilation in x axis and elapsed time in y axis and he obtained a S - shaped curve indicating the normal progress of the labour. Thus the graph helps to judge the nature and progress of labour and decide when to intervene.

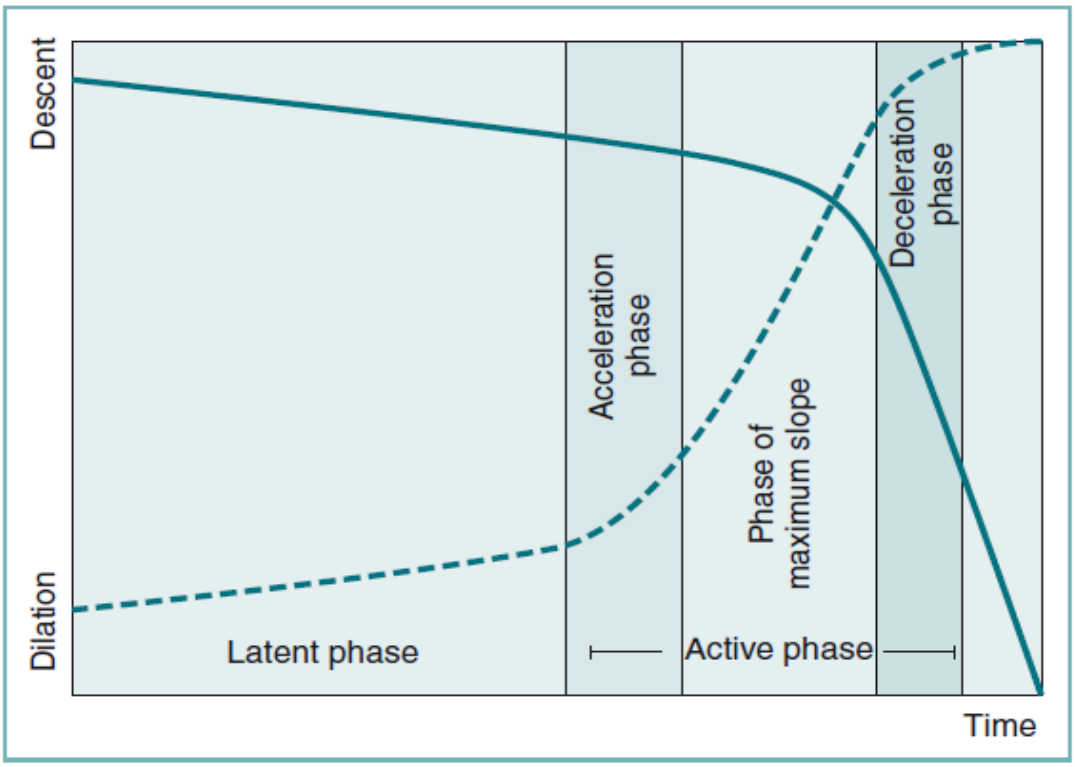


FIGURE 18-5 The Friedman curve. (From Friedman EA. Patterns of labor as indicators of risk. Clin Obstet Gynecol 1973; 16:172-83.)

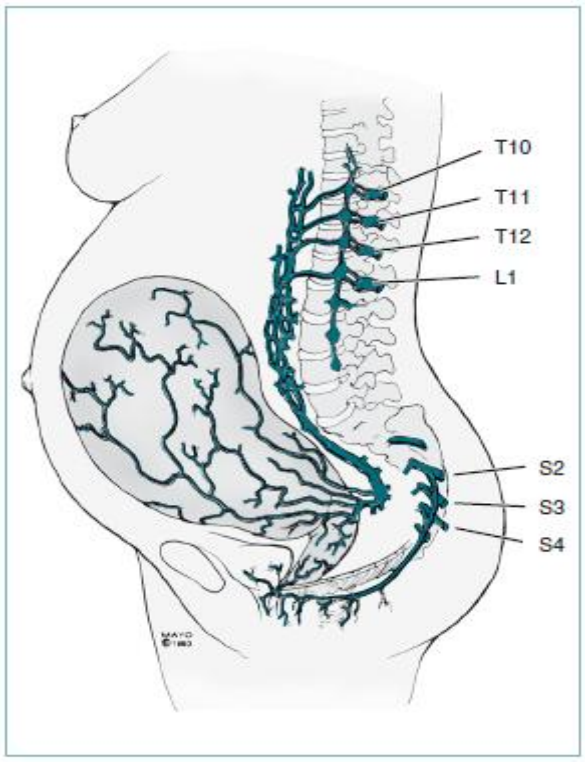
The first stage is further divided into latent phase – upto 4 cm of cervical dilation and active phase – from 4 cm to full cervical dilation. The active phase is further divided into acceleration phase, phase of maximum slope and deceleration slope.

In nullipara the latent phase lasts for 20 hrs and in parous women it lasts for 14 hrs. In active phase , the cervival dilation in nullipara is 1.2 cm /hr and in parous women – 1.5 cm/hr.

Thus Friedman curve serves as a guide to decide when to intiate labour epidural analgesia. This curve also guides to decide the mode of delivery of fetus by observing the course of labour . A prolonged latent phase is when it exceeds 20 hrs in a nullipara and 14 hrs in multipara patient. The cervix remains at 4 cm or less but is completely effaced. Arrest of dilation is defined as when the cervix undergoes no further change after 2 hrs in active phase of labour. A prolonged second stage is defined as a descent of less than 1cm/hr in nullipara and 2 cm/hr in multipara. Failure of head to descend 1 cm in station after adequate pushing is referred as arrest of descent.

EPIDURAL LABOUR ANALGESIA

Epidural and spinal analgesic techniques are the most versatile and effective methods of intrapartum pain relief. During the first stage of labour , pain is due to distention of the lower uterine segment and cervix. Painful impulses are transmitted by means of visceral afferent nerve fibres, which accompany sympathetic nerve fibres and enter the spinal cord at T10, T11,T12 AND L1. As labour progress and fetus descends in the birth canal, distention of the perineum and vagina results in painful impulses that are transmitted via the pudendal nerve S2S3S4.Neuraxial analgesia is the only form of analgesia that provides pain relief for both stages of labour.



Benefits

1. The ideal labour analgesic technique is safe for both mother and fetus and does not interfere with progress of labour and delivery. The ideal technique provides consistent pain relief, has long duration of action, minimises undesirable side effects and minimises ongoing demands on the anaesthesia providers time.
2. Effective epidural analgesia reduces maternal catecholamine plasma concentration. Decreased alpha and beta receptor stimulation result in uncompromised uteroplacental perfusion and effective uterine activity. Effective epidural analgesia reduces hyperventilation -hypoventilation cycle.
3. The rapid initiation of epidural anaesthesia for caesarean section.
4. Epidural analgesia facilitates blood pressure control in preeclamptic mothers
5. Blunts the hemodynamic effects of uterine contractions- sudden increase in preload , tachycardia, increased SVR , hypertension and hyperventilation in patients with medical complications
6. Indication :

   *Maternal request

Contraindications

* Patient refusal

*Elevated Intracranial pressure

* Skin or soft tissue infection at the site of needle entry

* Coagulopathy

* Maternal hypovolemia

TECHNIQUES IN LABOUR ANALGESIA

Non Pharmacological Techniques

- Emotional support
- Psychoprophylaxsis (Dick Read)

Education program, Strong focus of attention , Human support, Relaxation techniques of voluntary muscles , Breathing techniques and Specific techniques to concentrate on

- Touch and massage
- Hydrotherapy
- Biofeedback
- Intradermal water injection
- Lamaze technique – Deep breath taken at the beginning of contraction followed by rapid shallow breathing or the remaining duration of contraction.
- Transcutaneous electrical nerve stimulation (TENS)
- Acupuncture
- Hypnosis
- Bradley Leboyers technique

Pharmacological Techniques

- Opiods
- Inhalational analgesia
- Regional analgesia

1. Epidural analgesia:

Adv – continous analgesia, no dural puncture, ability to extend analgesia to anaesthesia for caesarean section

Disadv – slow onset, large dose required, risk of LAST, fetal toxicity

2. Subarachnoid block :

Adv – simple to perform, rapid onset, low drug dose and immediate sacral analgesia

Disadv – limited duration of analgesia

3. Combined spinal – Epidural :

Adv – continous analgesia, low drug dose , rapid onset , complete analgesia ,decreased incidence of PDPH and conversion to anaesthesia for caesarean delivery.

4. Paracervical block :

Local anaesthetic injected submucosally into fornix and lateral to cervix

Adv – simple to perform, doesnot affect progress of labour

Dis adv – Fetal tachycardia, LAST, postpartum neuropathy, Infection

5. Pudendal block :

Needle advanced through the sacrospinous ligament via trans vaginally under ischial spine both sides

Adv –satisactory for vaginal and outlet forceps delivery.

Disadv – LAST, infection, hematoma and sciatic nerve block

6.Lumbar sympathetic block

Side Effects

1. HYPOTENSION – It is defined as 15 to 20 % fall in systolic blood pressure from baseline or systolic blood pressure < 100 mm Hg. The incidence of hypotension in labouring women or less than non labouring due to autotransfusion during every contraction. Hypotensive episodes are treated with left uterine displacement before delivery, intravenous fluids or vasopressors. The treatment should be aggressive if the parturient is symptomatic and if there is change in fetal heart rate pattern.
2. INADEQUATE ANALGESIA
3. INFECTION :

   Meningitis and epidural abscess can occur if aseptic precautions are not correctly followed.
4. EPIDURAL HAEMATOMA

   It is a very rare complication and leads to neurological deficits. Hypecoagulable state of pregnancy is a protective factor.

EPIDURAL TECHNIQUE

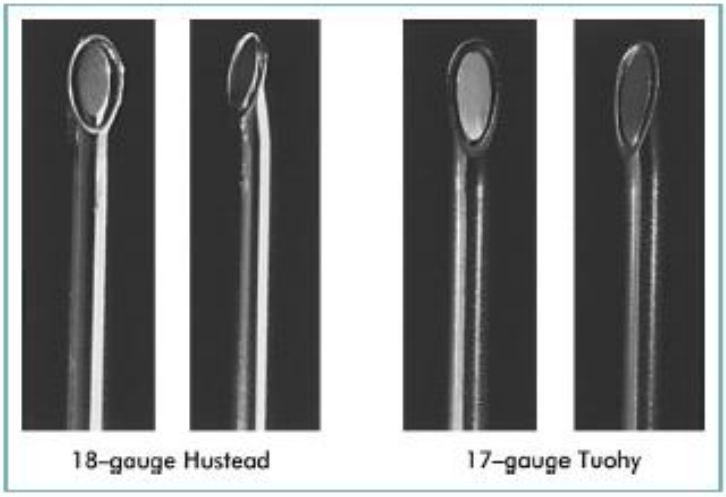
Preparation

Informed consent after explaining the anaesthesia procedure and risks to be obtained. Resuscitation equipments are kept ready for the management of serious complications of epidural analgesia. Parturient shifted in left lateral position to OT and connected to monitors to record basal vital parameters. After securing an IV access, Patient hydrated with 10 ml/kg of crystalloid solution prior to procedure. Touhey needle is routinely used for performing epidural which comes in a curved 15 to 30 degree Huber tip to reduce the risk of accidental dural puncture and guide the catheter cephalad. The catheter is made of flexible ,calibrated ,durable radiopaque plastic with a single or multiple side orifices. Muilti orifice catheters are superior with less incidence of inadequate analgesia. Multiorifice catheters in pregnant patients resulted in increased incidence of epidural vein cannulation.

Position and procedure

Patient positioned in right lateral position, epidural space is identified with 18 G Touhey needle at L3L4 or L4L5 interspace using LOR to air. Lateral position is advantageous as it reduces orthostatic

hypotension , patient feels comfortable and FHR monitoring is easy.19 G epidural catheter is threaded into the epidural space.



Test Dose

Epidural test dose is initiated with 3 ml of 1.5 % lignocaine with 5 mcg/ml of 1:2 lakh dilution epinephrine is injected through epidural catheter. An increase in heartrate of 20 bpm within 45 seconds is 100 % sensitive and specific for intravascular injection in unpremedicated parturients. The intravenous injection of an epinephrine containing test dose results in a sudden and fast acceleration in maternal heart rate within one minute. Thus careful assessment of the rate of increase in maternal heart rate helps to distinguish a contraction induced increase in heart rate from the effect of intravenously injected epinephrine.

The epidural catheter design and speed of injection may affect the reliability of the epidural test dose. Multi orifice catheters have three

potential sites of exit for injected fluid or air and the orifices may lie within two different compartments . If injected too slowly, air or fluid preferentially exits the proximal orifice. The distal orifice is both the most difficult to test and the one most likely to be positioned outside the epidural space.

Loading Dose

After ruling out intrathecal and intravascular injection, loading dose of the local anaesthetic with opiods are given.

Techniques to Minimise LA Toxicity

1. Observation of passive return of CSF or blood
2. Test dose administered in between contractions
3. Aspiration between each dose
4. Incremental dose administration
5. Verbal contact with the patient
6. Assessment of appropriate level and density of sensory and motor blockade.

BUPIVACAINE

Bupivacaine is an amide group of local anaesthetic agent. Bupivacaine is 3 to 4 times as potent as Lignocaine and longer acting. But onset time is slower than lignocaine.

Chemistry

Bupivacaine is an anilide compound and derived from mepivacaine. Bupivacaine is a homologue of Mepivacaine with a molecular formula of C18N2OH28HCl.

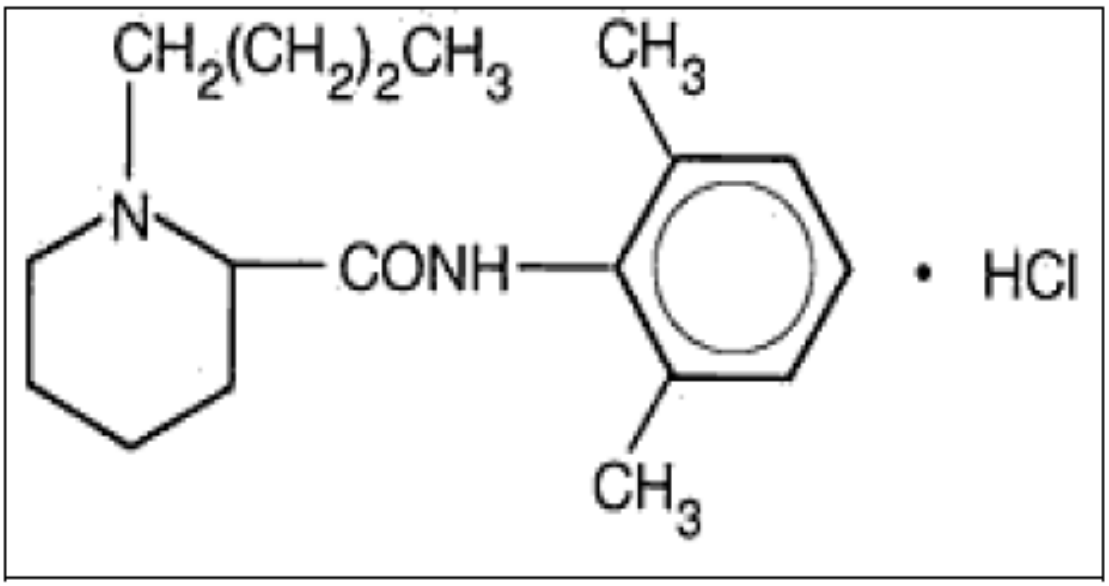


Fig. 7: Chemical structure

Mechanism of Action

Bupivacaine inhibits the sodium chloride channel conductance and hence depolarisation of neuronal membranes. It produces reversible conduction blockade.

Physicochemical Properties

It is a very stable compound and can withstand repeated autoclaving. Its a lipid soluble drug . It is 80 to 90 % protein bound and less cumulative than Lignocaine. It has longer latency but longer acting. The pKa of the drug is 8.1, which determines the onset of action. If the pKa is near physiological pH, more rapid onset of action which means optimal level of unionised fraction.

Pharmacodynamics

The onset of action of Bupivacaine is 6 to 10 min and maximum anaesthesia is obtained between 15 and 20 min. The duration of anaesthesia varies according to the type of block. The average duration of peripheral block is 3.5 to 5 hrs. For peripheral nerve block its 5 to 6 hrs.

Pharmacokinetics

Bupivacaine could be detected in blood within 5 min of infiltration or following epidural. Plasma level is related to the total dose administered. It crosses the placental barrier by passive diffusion at a lowest level since it is highly protein bound. The umbilical vein to maternal vein concentration ratio is 0.3.

After epidural administration of bupivacaine for labour, patient perceives first pain relief after 8 to 10 min and peak effect is achieved by 20 min. Duration of analgesia is about 90 min.

Dose

The maximum safe dose of Bupivacaine is 3 mg/kg. The concentration range are 0.25%, 0.5% and 0.75% plain. 0.25% with adrenaline 1:400000 and 0.5% with adrenaline 1:200000 and 0.5% hyperbaric Bupivacaine.

Metabolism

The liver is the primary site of metabolism. Most of the drug is partly metabolised by cytochrome P 450 enzyme and N-dealkylation. About 10% of the drug is excreted unchanged in urine.

The advantages of using Bupivacaine are

1. Less cumulative
2. Less tachyphylaxsis
3. Selective differential blockade
4. Less placental transfer

Adverse Effects

Systemic toxicity of local anaesthetics is primarily due to plasma levels. Commonest cause of acute systemic toxicity is accidental intravascular injection and this is a particular risk in epidural injection. Toxicity is best avoided by using appropriate dose for the particular procedure. Toxicity is manifested as derangement of the CNS and CVS . Lower doses of drug is required to produce CNS toxicity whereas higher dose is required to produce CVS toxicity.

Central nervous system

Bupivacaine causes both excitation and depression of CNS depending on the plasma levels. A feeling of light headedness, visual and auditory disturbances like tinnitus occurs. It is followed by shivering, muscle twitching and tremors which progress to generalised tonic clonic seizures.

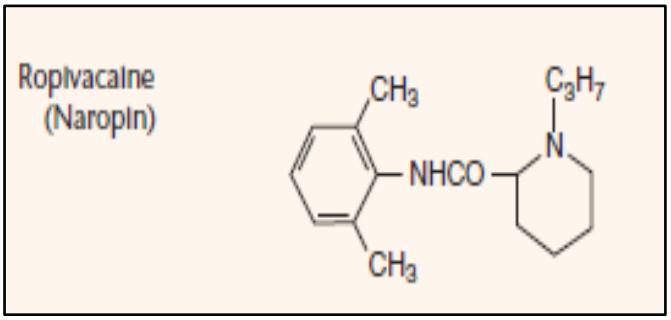
Cardiovascular system

Decrease in the rate of depolarisation in the purkinje fibres and ventricular muscle. Action potential duration and effective refractory period are also decreased. Bupivacaine depress the rapid phase of depolarisation . Use dependent block is slower in bupivacaine and hence incomplete restoration of the sodium channel availability in between action potentials. Hence ventricular arrhythmias are more common following large doses of bupivacaine. Cardiac resuscitation is very difficult and potentiated by acidosis and hypoxia. Cardiac toxicity due to bupivacaine is treated with 20 % Intralipid.

ROPIVACAINE

Chemical Structure

Ropivacaine is an amide local anaesthetic. Its a pipecoloxylyl derivative. Its a single levorotatory enantiomer of bupivacaine.



Physicochemical Properties

Ropivacaine is a water soluble hydrochloride salt. It is less lipid soluble and less potent than Bupivacaine. It is highly protein bound mainly to alpha 1 acid glycoprotein with an unbound fraction of 6 %.The pKa is 8.1 .

Mechanism of Action

Ropivacaine inhibits the sodium chloride channel conductance and hence depolarisation of neuronal membranes. It produces reversible conduction blockade. Atleast 1 to 3 nodes of Ranvier should be exposed to local anaesthetics in a myelinated fibres to prevent conduction as

sodium channels are concentrated in the nodes of Ranvier while in unmyelinated fibres sodium channels are present throughout.

Pharmacodynamics and Kinetics

Ropivacaine has slower onset when compared with Bupivacaine. It is less lipid soluble. It has an onset around 10 to 15 min .The maximum plasma concentration is proportional to the dose. It has a faster clearance and short elimination t1/2. The terminal half life is 1.8 hr. The drug readily crosses the placental barrier. The degree of plasma protein binding in fetus is less than in mother and hence less plasma concentration in the fetus.

Dosage

Ropivacaine comes in 0.25%, 0.5% nd 0.75 % plain.

Metabolism

Ropivacaine is extensively metabolised by liver by cytochrome P 450 enzyme by aromatic hydroxylation. The metabolites are excreted in urine.

Advantage of Ropivacaine over Bupivacaine in Labour Analgesia

Ropivacaine at lower doses produce senory block with limited and non progressive motor blockade. Hence it is used in ambulatory labour analgesia.

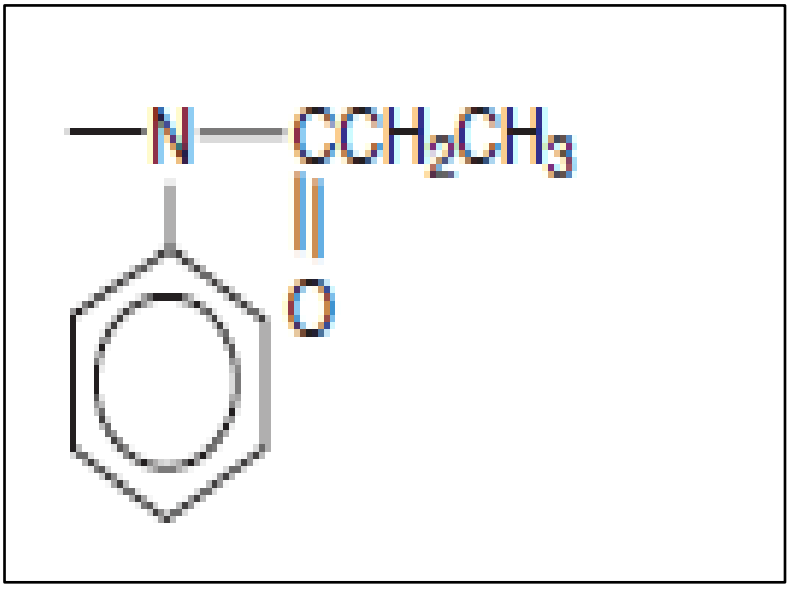
Side Effects

Ropivacaine causes both excitation and depression of CNS depending on the plasma levels. A feeling of light headedness , visual and auditory disturbances like tinnitus occurs. It is followed by shivering, muscle twitching and tremors which progress to generalised tonic clonic seizures. The cardiovascular toxicity is less when compared with Bupivacaine.

FENTANYL

Chemical Structure

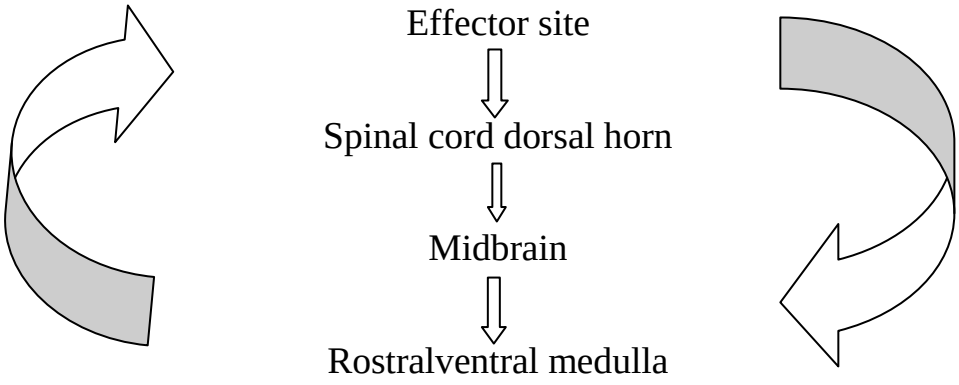
Fentanyl is a synthetic opiod belonging to phenylpiperidine series. It is structurally related to meperidine.



Mechanism of Action

Fentanyl being a selective mu opiod agonist it interrupts the pain pathway both nociception and neuropathic pain.

Pain Pathway



Fentanyl

⇩

Gi protein coupled receptors

⇩

Inhibit adenylate cyclase

⇩

Inhibits voltage gated Ca channels

⇩

Decreased neuronal excitability

Advantages over other Opiods

1. Brevity of action
2. Precise and easily titrable
3. Rapid onset and recovery
4. Non cumulative effect

Pharmacokinetic and Dynamics

Fentanyl has rapid onset 6.8 min and shorter duration of action. It is highly lipid soluble and highly protein bound. It undergoes rapid redistribution and large Vd. Elimination t1/2 is greater due to high lipid solubility. It has increased context sensitive half time. Fentanyl decreases sinus baroreceptor reflex. It increases ICP inspite of normal paCO2.

Metabolism

The drug is extensively metabolised in liver by N- demethylation and is excreted via kidneys.

Fentanyl in Labour Analgesia

Fentanyl rapidly crosses placenta and appears in fetal blood as early as 1 min with levels peaking in 5 min. The umbilical vein to maternal vein ratio is 0.37.The rapid transfer is because of LMW and high lipophilicity. Fentanyl binds to both albumin and alpha-1acid glycoprotein. About 80 % of the drug is protein bound and one third of the drug is unbound and therefore available for placental transfer. In the neonates glycoprotein levels are comparatively lower and hence increased free form of the drug in neonate and more susceptibility to toxicity.

As fentanyl is a basic drug it is more ionised in the fetus than in mother. In case of fetal acidosis increased chances of ion trapping in the fetus.

Safe dose

Epidural – 20 to 40 mcg

Spinal – 10 to 20 mcg

Fentanyl is considered safe because of its short half life and rapid clearance and normal neurobehavioral assessment of neonate is established.

The addition of Fentanyl to labour epidural analgesia

- ❖ Decreases latency
- ❖ Prolongs the duration of analgesia
- ❖ Improves quality of analgesia
- ❖ Decrease the overall LA dose
- ❖ Allows usage of more dilute doses

Side Effects

Fentanyl produces hypotension, bradycardia , pruritis and chest wall rigidity.

Aims and Objectives

AIMS AND OBJECTIVES

To compare the following parameters

- Analgesic efficacy
- Onset of action
- Total dose of anaesthetic required
- Motor blockade intensity
- Haemodynamics
- Mother satisfaction

In two group patients who have been given lumbar epidural analgesia for normal vaginal delivery.

Review of Literature

REVIEW OF LITERATURE

Helene Finegold et al (2000) compared the analgesic efficacy of 0.1% bupivacaine and 2 mcg/ml fentanyl with 0.1 % ropivacaine and 2mcg/ml fentanyl in a double blind study among 100 nulliparous parturients for labour analgesia. He found that onset time and visual analogue score were almost identical between groups. 80% patients in the ropivacaine group had no significant motor block after 1 hour when compared with 55 % in bupivacaine group. They found that both ropivacaine and bupivacaine produced satisfactory epidural labour analgesia and ropivacaine producing less significant motor block for the first stage labour.

David Campbell et al (2000) conducted a randomized, double blind study comparing the efficacy of 0.08 % ropivacaine and 2 mcg /ml with 0.08 % bupivacaine and 2 mcg/ml fentanyl among 40 nulliparous parturients to intiate labour analgesia using epidural technique. They found that ropivacaine and fentanyl group provided consistent effective analgesia without producing maternal and fetal side effects. They also concluded that ropivacaine group parturients were able to ambulate and void urine.

Meister GC et al(2000) conducted a randomised, controlled clinical trial among 50 labouring women and compared 0.125% ropivavcaine and 2 mcg/ml fentanyl with 0.125% bupivacaine and 2mcg/ml fentanyl for

labour analgesia using patient controlled analgesia technique. They found that there were no statistical differences in pain scores, the amount of local anaesthetic required, patient satisfaction and side effects between the two groups. They concluded that ropivacaine and fentanyl provided ambulatory analgesia with less motor blockade.

M Dressner et al (2000) conducted a randomised double blind study and among 203 parturients and compared 0.1 % bupivacaine and 2mcg/ml fentanyl with 0.22 % ropivacaine and 2mcg/ml of fentanyl. Both groups received 15 ml of loading dose followed by 8 ml/hr of continuous infusion and topups of 10 ml.Breakthrough pain were treated with escape topups of 10 ml 0.25% bupivacaine .They concluded that ropivacaine group received fewer routine topups and escape topups and there were no differences in motor blockade or mode of delivery between groups.

Jaime Fernandez et al (2001) conducted a prospective blind studyamong 98 labouring parturients who received 0.0625 % bupivacaine and 2mcg/ml fentanyl with 0.1 % ropivacaine and 2mcg/ml fentanyl as infusion .The dose used in both groups were 15ml/hr and topup doses of 5ml if patient perceived pain. They concluded that there were no differences in intensity of pain, level of sensory blockade , degree of motorblockade, hemodynamics parameters, mode of delivery-

spontaneous/ instrumental or caeserean ,neonatal outcome and patient satisfaction.

Nancy Merson et al (2001) conducted randomised study among 68 parturients and compared 0.25 % bupivacaine and 10 mcg of sufentanyl, 0.25% ropivacaine and sufentanyl and 0.125% bupivacaine or ropivacaine with sufentanyl. The initial dose of 10 ml of LA with opiod followed by continuous infusion of study drug with 0.6 mcg/ml of sufentanyl at a rate of 8 -14 ml/hr. They concluded that parturients receiving bupivacaine produced statistically significant motor blockade compared to ropivacaine group and pain relief was less satisfactory in ropivacaine group.

Pirbudak et al (2002)conducted randomise study among 44 labouring women and compared 0.05% ropivacaine and 0.05 % bupivacaine and combined both groups with 0.00015 % fentanyl for labour analgesia. The intial loading dose was with 0.125 % bupivacaine and 50 mcg fentanyl with 0.05 % ropivacaine and 50 mcg fentanyl . Then PCEA was initiated and 10 ml/hr of 0.05 % bupivacaine and 0.00015 % fentanyl in one group and 0.05 % ropivacaine and 0.00015 % fentanyl in another group. They concluded that both drugs provide safe and good analgesia and also no differences in parturients assessment of the motor blockade and mode of delivery between the two groups.

P.D.W .Fettes et al(2006) conducted a randomised double blinded study and compared intermittent bolus vs continuous administration of ropivacaine with fentanyl for epidural labour analgesia. 15 – 20 ml of plain ropivacaine was titrated until analgesia and bilateral sensory block to T10 was achieved. Following analgesia was maintained with ropivacaine 2mg/ml with 2mcg/ml of fentanyl infusion or 10 ml of same concentration in hourly boluses. An additional 10ml was given on request. They found no differences in patient charecteristics, obstetric and neonatal outcome, sensory and motor block among two groups. The total drug dose in the intermittent group was lower and duration of uninterrupted analgesia was longer. Hence they concluded that intermittent bolus doses were efficacious mode of analgesia.

Neera shah et al (2007) conducted a randomised prospective double blinded study among 162 parturients and compared 0.125 % bupivacaine and 100 mcg fentanyl ,0.125 % levobupivacaine and 100 mcg fentanyl with 0.2 % ropivacaine and 100 mcg fentanyl. All patients received a loading dose of 8 ml of local anaethetic with 100 mcg of fentanyl followed by 12 ml/hr of LA with 2mcg/ml of fentanyl. They concluded that there were no differences in pain scores, sensory and motor blockade among three groups.

Wang Li Zhong et al (2010) conducted a randomised study in 450 nulliparaous women and compared ropivacaine, bupivacaine and levobupivacaine with sufentanyl for patient controlled epidural analgesia at different concentrations of 0.05% , 0.075% , 0.125% or 0.15% of either ropivcaine or bupivacaine or levobupivacaine with 0.5 mcg/ml sufentanyl by PCEA technique. They found that there were no significant differences in analgesia efficacy, pain scores, hourly local anaesthetic concentrations and sensory or motor blockade. Hence concluded that analgesic efficacy depends on concentration and not on type of anaesthetic used.

Sumit kalra et al (2010) conducted randomised controlled study among 50 parturients and compared 0.0625%bupivacaineand 2.5mcg/ml of fentanyl with 0.0625% bupivacaine and 0.25 mcg/ml sufentanyl The initial dose was 10 ml of local anaesthetic followed by infusion .They concluded that both fentanyl and sufentanyl were equally effective in labour analgesia with hemodynamic stability, maternal satisfaction and with little maternal and fetal side effects.

W Breen et al conducted prospective randomised double blinded study among 203 parturients and compared 75 mcg of fentanyl and an infusion of 2.5 mcg/ml of fentanyl at 15 ml/hr with 0.04 % bupivacaine,1.7 mcg /ml epinephrine and 1.7 mcg /ml fentanyl at a rate of 15 ml bolus

followed by 15 ml/hr infusion. They concluded that parturients receiving fentanyl group ambulated and the bupivacaine group had longer duration of analgesia.

Robert R Gaiser et al compared 0.25 % ropivacaine and 0.25 % bupivacaine among 81 parturients for labour analgesia using 8 -12 ml of loading dose in each group followed by 8 – 10 ml/hr of infusion . They conclude that both the drugs provided excellent analgesia and there were no major side effects in mother or neonate.

Materials & Methods

MATERIALS AND METHODS

Design

Randomized double blind controlled study

Participants

Single anaesthesiologist under supervision of a senior anaesthesiologist & with help of two anaesthesia technicians

Centre

Mahatma Gandhi Memorial Govt. Hospital attached to K.A.P. Viswanatham Government Medical College, Trichy.

Period

June 2015 – June 2016

Sample Size

Fifty (N=50)

Groups

Group B: Receive 0.1 % Bupivacaine with 2 mcg/ml Fentanyl (n=25)

GroupR:Receive 0.1 % Ropivacaine with 2 mcg/ml Fentanyl(n=25)

Inclusion Criteria

- Primigravida with term gestation
- Singleton pregnancy with vertex presentation
- ASA physical status 2
- Uncomplicated pregnancy
- Normal fetal heart rate
- Height > 150 cm
- Cervical dilatation < 5 cm

Exclusion Criteria

- Multiple gestation
- Preterm
- ASA physical status 3 & above
- Contraindications to neuraxial analgesia
- Drug allergy
- Cervical dilatation > 5 cm

Preparation of the Patient

After getting Institutional Ethical committee approval and patients consent, patients were randomized into one of the two groups. All patients were assessed prior to the procedure. A brief obstetric history was elicited. General and systemic examinations were carried out. Baseline heart rate, systolic, diastolic, mean blood pressure and fetal heart rate by CTG were recorded. Also cervical dilation and condition of membranes were recorded by the obstetrics post graduate.

Routine investigations like complete haemogram, random bood sugar, blood urea, serum creatinine, chest X-ray and electrocardiogram were performed.

Once inside the operating room, after connecting the routine monitors like Electrocardiography (ECG), Noninvasive blood pressure (NIBP) and Pulseoximetry (SPO_2) and the baseline parameters recorded. An Intravenous access was secured with 18 G venflon and all parturients were preloaded with 10 ml/ kg of Ringer lactate solution . The parturient and anaesthesiologist perfoming the technique and administering the drug were blinded to the drug. Under aseptic precautions patient in lateral position epidural space identified with 18 g Touhey needle in L3L4 or L4L5 in midline approach with loss of resistance to air technique and catheter threaded 6 cm into cephalad epidural space. After negative

aspiration for blood and CSF, test dose of 3 ml of 1.5 % Lignocaine with 5 mcg /ml of Adrenaline is administerd. Watch for change in heart rate of 20 beats per minute from baseline in 15 seconds to rule out inadvertent intrvascular spread of drug. Watch for motor blockade in 3 to 5 minutes to rule out intrathecal spread. Parturients with test dose positive are excluded from the study. Five minutes after administering the test dose, loading dose of 15 ml of the study drug – 0.1 % of Bupivacaine with 2 mcg/ml of fentanyl in Group B or 0.1 % Ropivacaine with 2mcg/ml of fentanyl in Group R is administered in 5 ml increments at intervals of 5 minutes. Parturients not experiencing adequate analgesia in 20 min are supplemented with additional 5ml of the study drug. Following the loading dose additional supplements of the drug are administered based on the VAS score upto a maximum of 20ml/hr, whenever VAS score exceeds 4.The patient monitoring was made in labour ward with boyles, drugs and equipments ready for resuscitation of the parturient in need of emergency. FHR monitoring was done using CTG. The per vaginal examination for cervical dilation was done by OG postgraduate.

The following parameters are recorded:

A. Hemodynamic parameters

1. Maternal Heart rate.

2. Blood pressure – systolic, diastolic and mean arterial pressures.

3. Oxygen saturation.

4. Fetal heart rate.

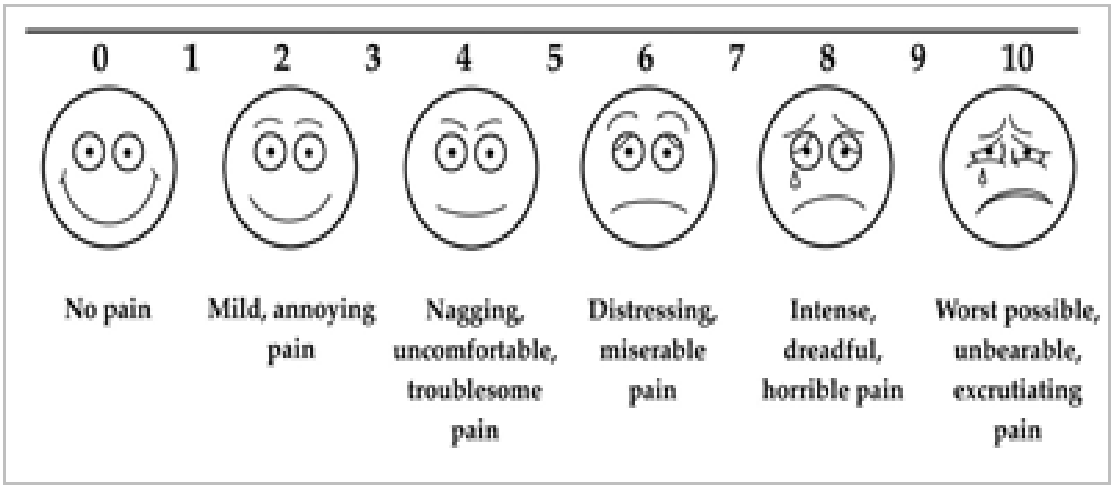
All the vitals are monitored and recorded continuously at 5,10,20,30,45,60 min and every 30 min after that until delivery.

Adverse effects like hypotension, bradycardia and oxygen desaturation are recorded and managed accordingly. Hypotension is defined as fall in systolic blood pressure by 20 % from baseline or SBP <90 mm hg. Hypotension is managed with left uterine displacement, IV fluids and bolus Inj. Ephedrine 6 mg top ups as and when required.

B. Non hemodynamic parameters

5. Cervical dilation – every 2 hours.

6. Pain score – assessed by visual analogue score (VAS) – 0 to 10



7. Highest level of sensory blockade- assessed by pin prick sensation

8. Degree of motor blockade is assessed by modified Bromage score.

Modified Bromage Score

Grade 0- Patient able to move at all the joints (Hip, Knee, and Ankle)

Grade 1- Unable to move at hip joint

Grade 2- Unable to move at both hip and knee joint

Grade 3- Unable to move at all the 3 joint hip, knee and ankle

9. Total dose of the local anaesthetic required.

All these parameters are recorded at 15 min after the loading dose till 1 hour and 30 min thereafter.

After delivery

1. Patients satisfaction score- assessed as excellent, good, fair or poor.
2. The mode of delivery – spontaneous, vaginal , instrumental vaginal and caesarean section
3. Total dose of local anaesthetic required.

Observation &Results

OBSERVATION AND RESULTS

The results obtained were analysed with SPSS (Statistical Package for Social Sciences) version 13.0 using t-test and chi square test.

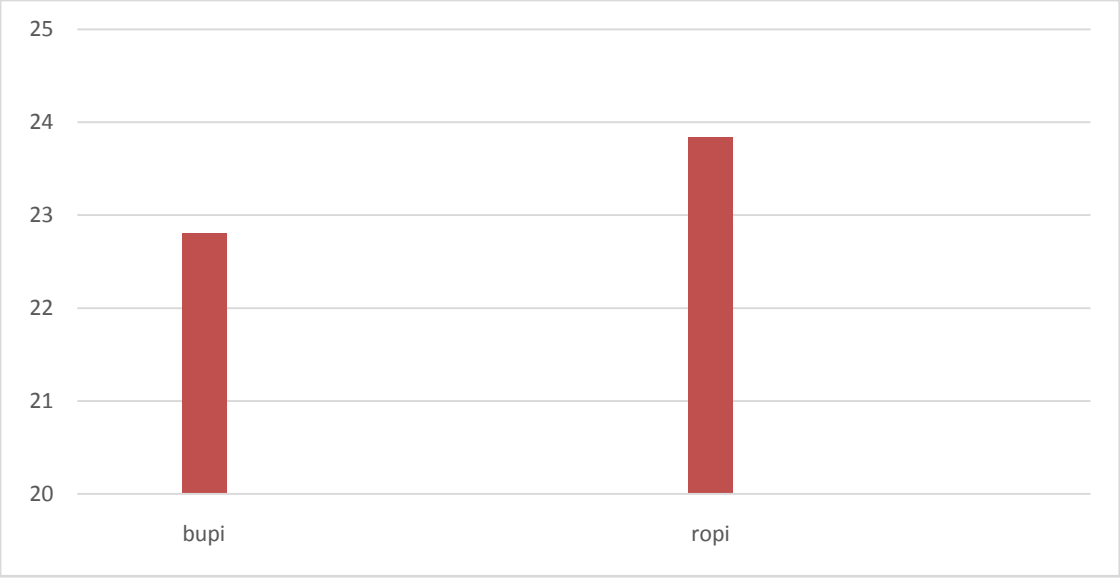
Demographic Variables

Table 1

	Mean Age	Mean Weight	Mean Height
Group B	22.80+/-1.80	51.20+/-1.80	154.08+/-5.08
Group R	23.84+/-2.09	50.32+/-5.77	152.92+/-3.39

Graph 1

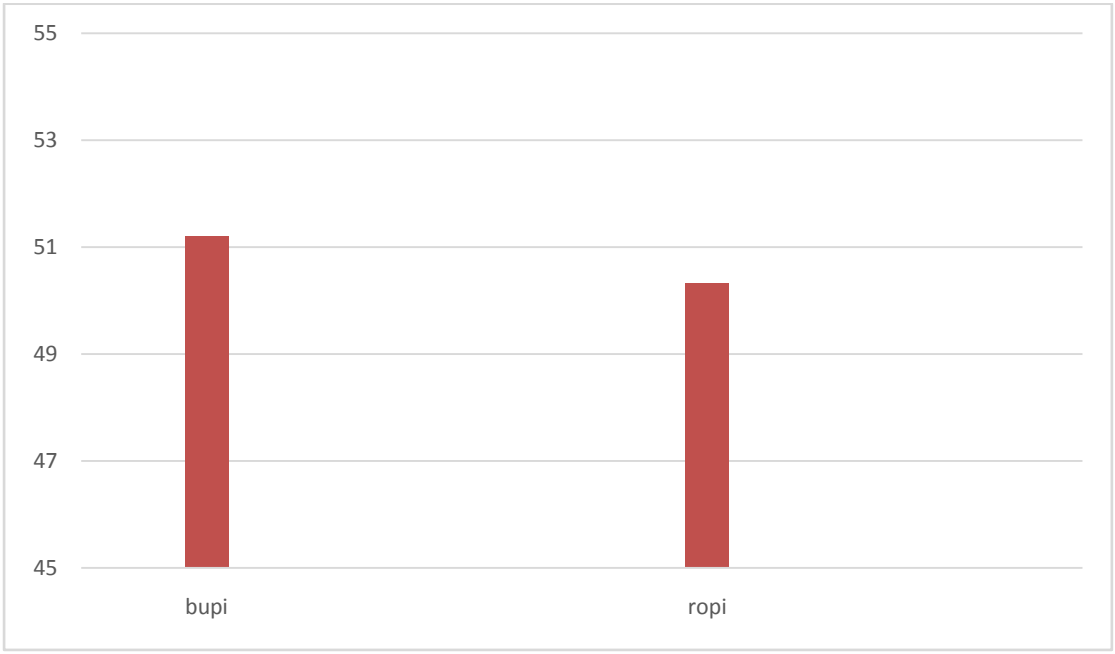
Mean Age



Mean age distribution is shown in table 1 and graph 1. Patients in the age group between 20 to 30 years were included in the study and statistical analyses showed their differences between the two groups to be statistically insignificant (p=0.066).

Graph 2

Mean weight



The mean weight of the patients in two groups is shown in the table 1 and graph 2 . The mean weight of the patients was 51.20 +/-6.75 kg in Group B and 50.32 +/- 5.77 kg in Group R. The differences were found to be statistically insignificant (p=0.623)

Graph 3

Mean height

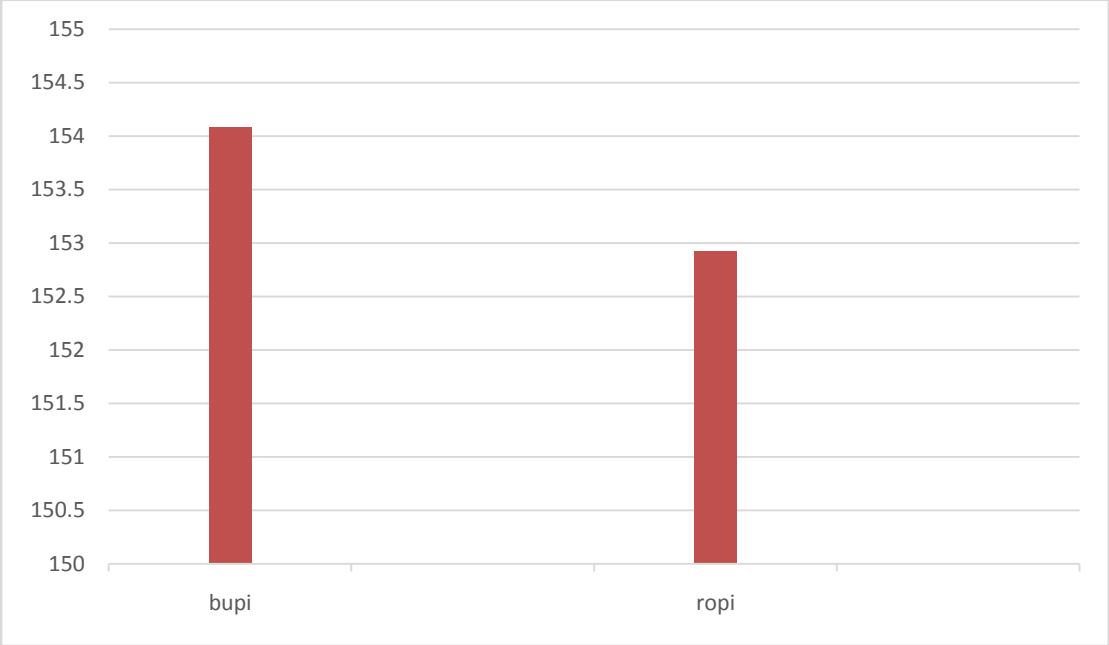


Table 1 and graph 3 shows the mean height of the patients among the two groups. Group B patients had a mean height of 154.08 +/- 5.08 cms and in Group R it was 152.92 +/- 3.39 cms and the differences were found to be statistically insignificant (p=0.347).

Table 2

Mean BMI (kg/m^2)

	Group B	Group R
Mean +/- SD	21.52 +/- 2.44	21.63 +/- 2.22

Graph 4

Mean BMI

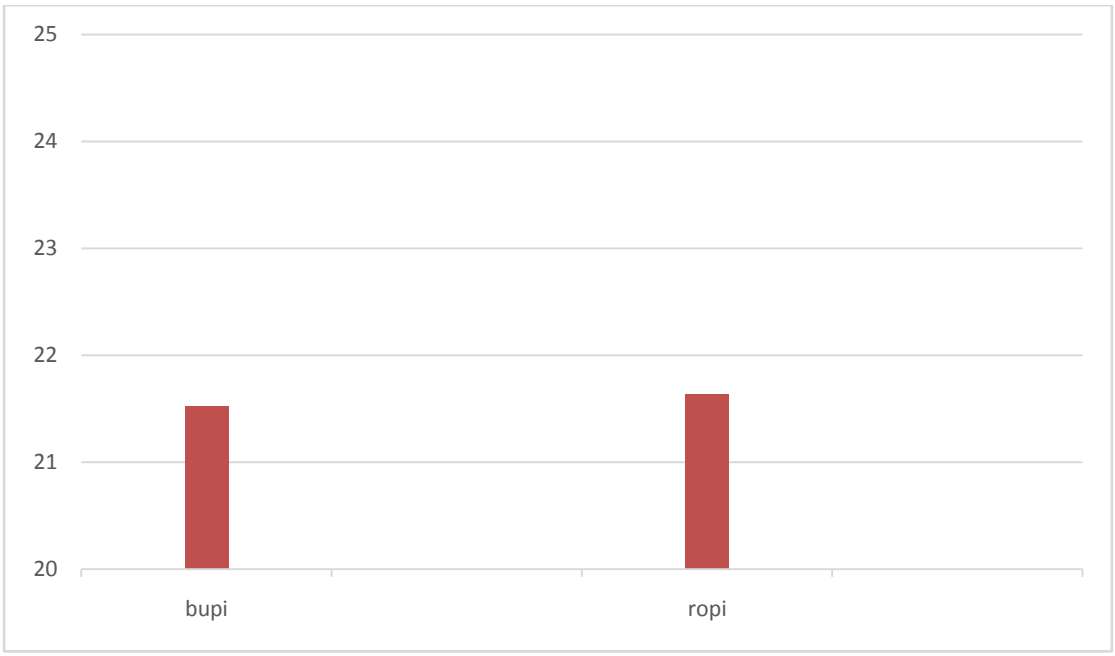


Table 2 and graph 4 shows the mean BMI of the patients among the two groups.

The mean BMI of the patients in Group B was 21.52 +/- 2.44 kg/m^2 and in Group R was 21.63 +/- 2.22 kg/m^2 and the differences were found to be statistically insignificant (p=0.869)

Table 3

Onset of Action

	Group B	Group R
Mean+/- S.D	13.08+/-2.01	15.96+/-2.05

Graph 5

Onset of Action

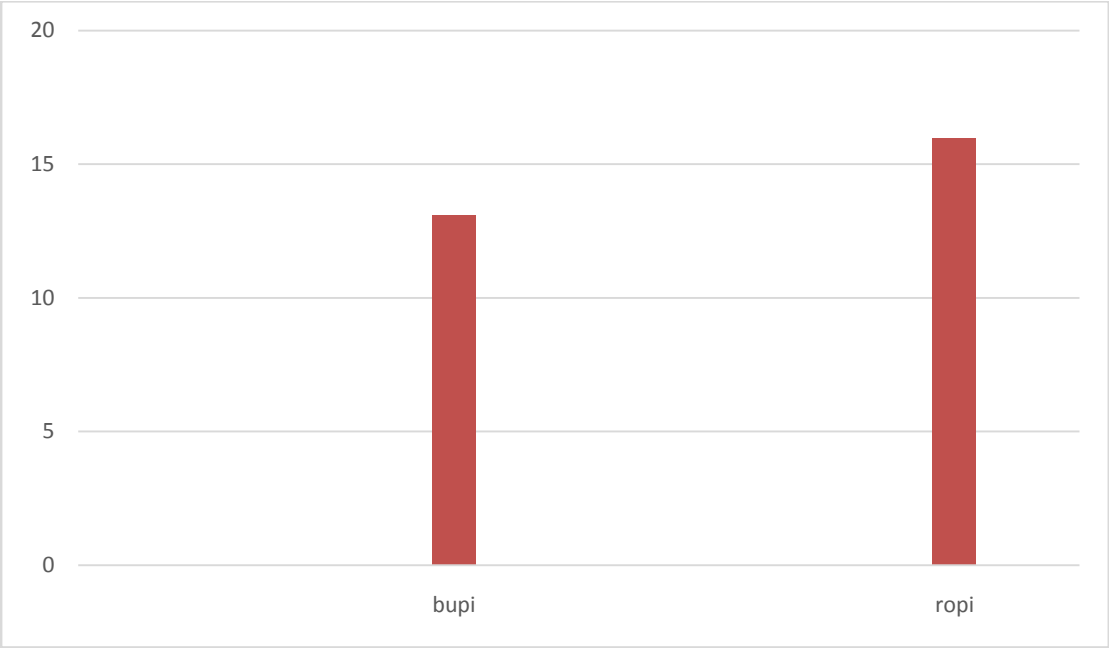


Table 3 and graph 5 shows the mean time of onset of action of the drug among the two groups.

The mean time of onset of action of the drug in Group B was 13.08+/- 2.01 min and in Group R was 15.96+/- 2.05 min and the differences were found to be statistically significant (p=0.00).

Table 4

Intensity of Motor blockade

	Group B	Group R
Mean +/- S.D	0.92+/-0.27	0.00

Table 4 shows the mean Intensity of motor blockade between the two groups.

The mean intensity of motor blockade in group B was 0.92+/-0.27 and there was no motor blockade in group R which was found to be statistically significant (p=0.00)

Table 5

Duration of First stage of labour

VARIABLES	MEAN	S.D	INFERENCE
BUPIVACAINE	216.60	30.32	**P >0.05**
ROPIVACAINE	210.52	20.88	**NS**

Table 5 shows the duration of first stage of labour in both the groups.

The mean of duration of first stage of labour in Group B, was 216.60 +/- 30.32 min and in Group R was 210.52 +/- 20.88 min and the difference between the groups were statistically insignificant (p = 0.143)

Table 6

Duration of Second stage of labour

VARIABLE	MEAN	S.D	INFERENCE
BUPIVACAINE	18.32	5.70	0.00
ROPIVACAINE	27.72	5.47	SIGNIFICANT

Table 6 shows the duration of second stage of labour in both the groups.

The mean of duration of second stage of labour in Group B, was 18.32 +/- 5.70 min and in Group R was 27.72 +/-5.47 min and the difference between the groups were statistically significant (p = 0.00)

Table 7

Duration of Third stage of labour

VARIABLEE	MEAN	S.D	INFERENCE
BUPIVACAINE	5.92	1.97	0.103
ROPIVACAINE	6.72	1.37	NS

Table 7 shows the duration of third stage of labour in both the groups.

The mean of duration of third stage of labour in Group B, was 5.92+/- 1.97 min and in Group R was 6.72+/- 1.37 min and the difference between the groups were statistically insignificant (p = 0.103)

Table 8

Apgar Score

VARIABLE	MEAN	S.D	INFERNECE
BUPIVACAINE	8.48	0.510	0.783
ROPIVACAINE	8.52	0.510	NS

Graph 6

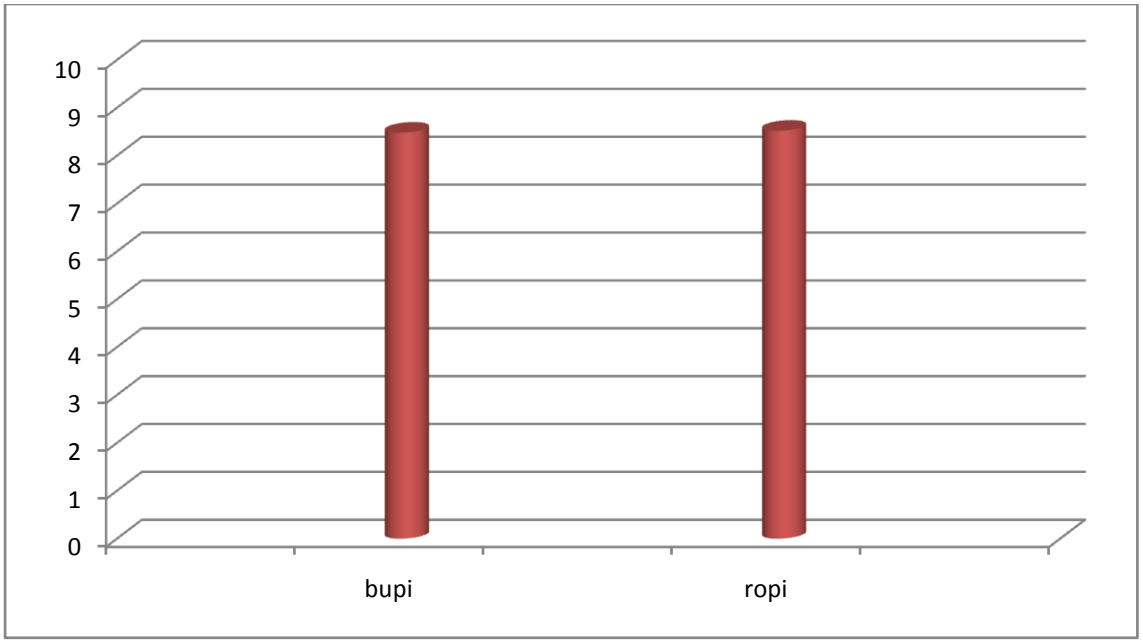


Table 8 and Graph 6 shows the Apgar score of the newborn between both the groups.

The mean Apgar of the new born in Group B, was 8.48+/- 0.51 and in Group R was 8.52+/- 0.51 and the difference between the groups were statistically insignificant (p = 0.783)

Table 9

Patient Satisfaction Score

Patient satisfaction	Group		Total
	B	R	
Excellent	4 16%	7 28%	11 22%
Good	21 84%	18 72%	39 78%
Total	25 100%	25 100%	50 100%

Graph 7

Patient Satisfaction Score

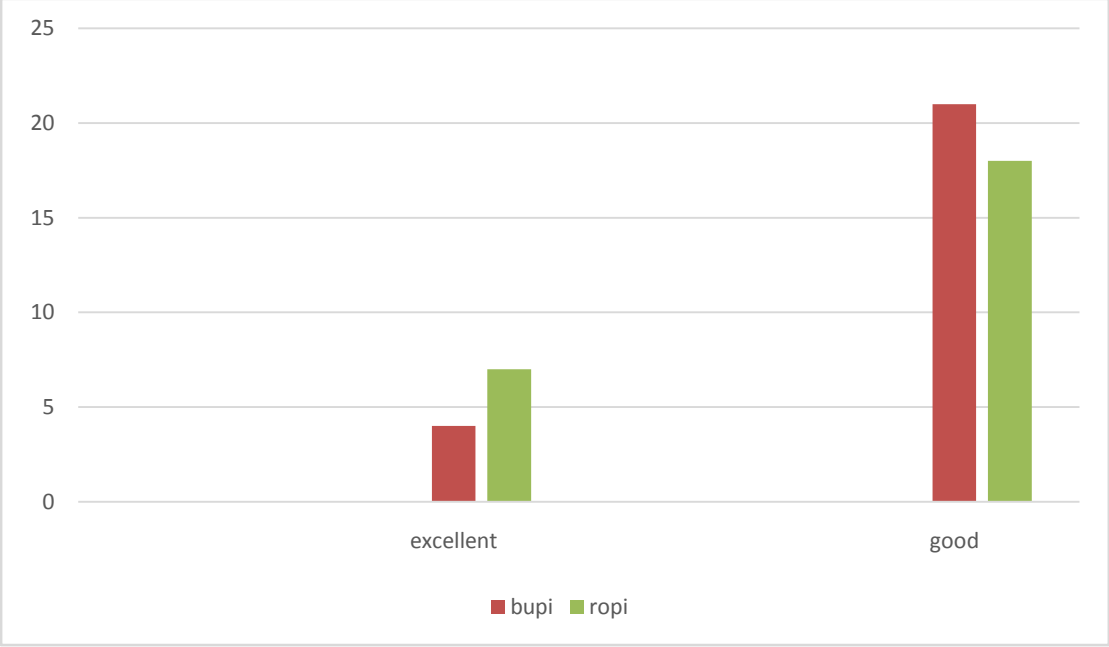


Table 9 and Graph 7 shows Patient satisfaction score for epidural labour analgesia between the two groups.

In Group B, patient satisfaction was excellent in 4 and good in 21 patients.

In Group R, patient satisfaction was excellent in 7 and good in 18 patients.

The Patient satisfaction score for epidural labour analgesia between the two groups were statistically insignificant ($p = 0.306$).

Table 10

Mode of Delivery

Mode of delivery	Group		Total
	B	R	
Spontaneous	23 92%	22 88%	45 90%
Instrumental	2 8%	3 12%	5 10%
Total	25 100%	25 100%	50 100%

Graph 8

Mode of Delivery

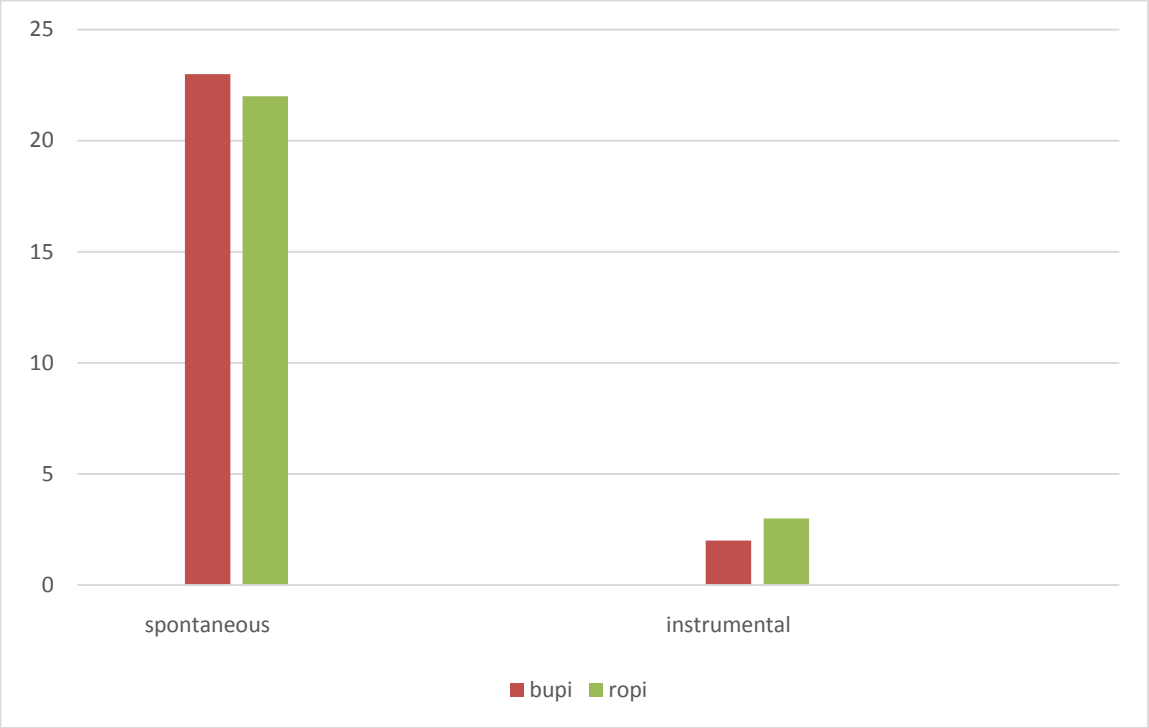


Table 10 and Graph 8 shows mode of delivery following epidural labour analgesia between the two groups.

In Group B, spontaneous delivery was in 23 and instrumental in 2 patients.

In Group R, spontaneous delivery was in 22 and instrumental in 3 patients.

The mode of delivery between the two groups was statistically insignificant (p = 0.637)

Table 11

Total Local Anaesthetic Required (ml)

VARAIBLE	MEAN	S.D	INFERENCE
BUPIVACAINE	67.00	8.036	0.00
ROPIVACAINE	75.40	4.311	SIGNIFICANT

Graph 9

Total Local Anaesthetic Required (ml)

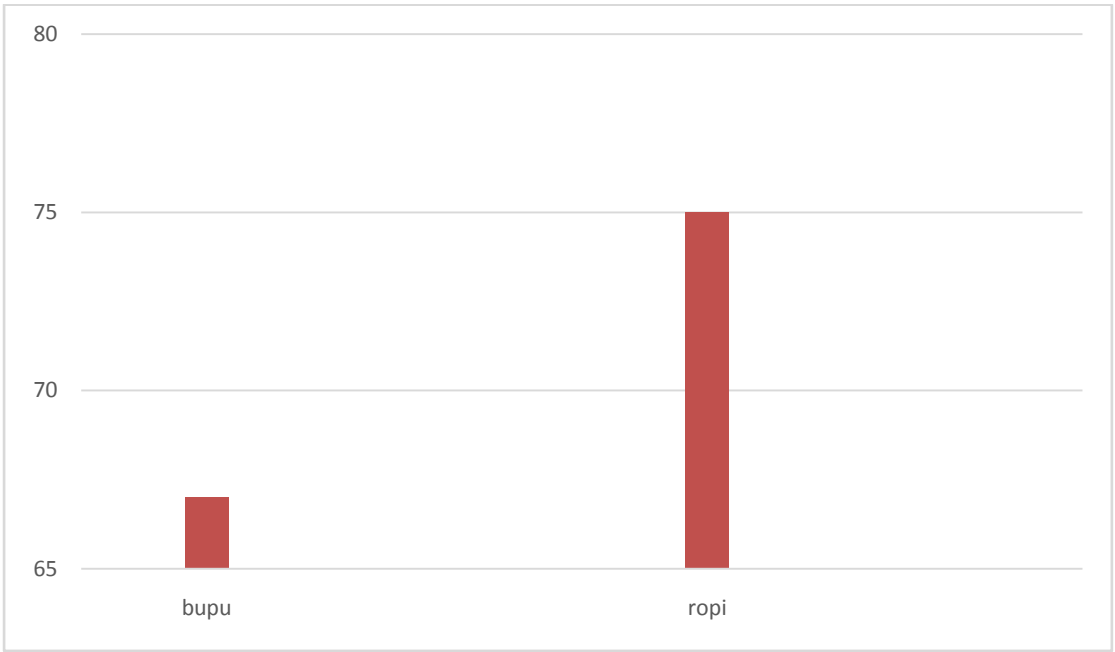


Table 11 and Graph 9 shows the volume of local anaesthetic used in epidural labour analgesia between the two groups.

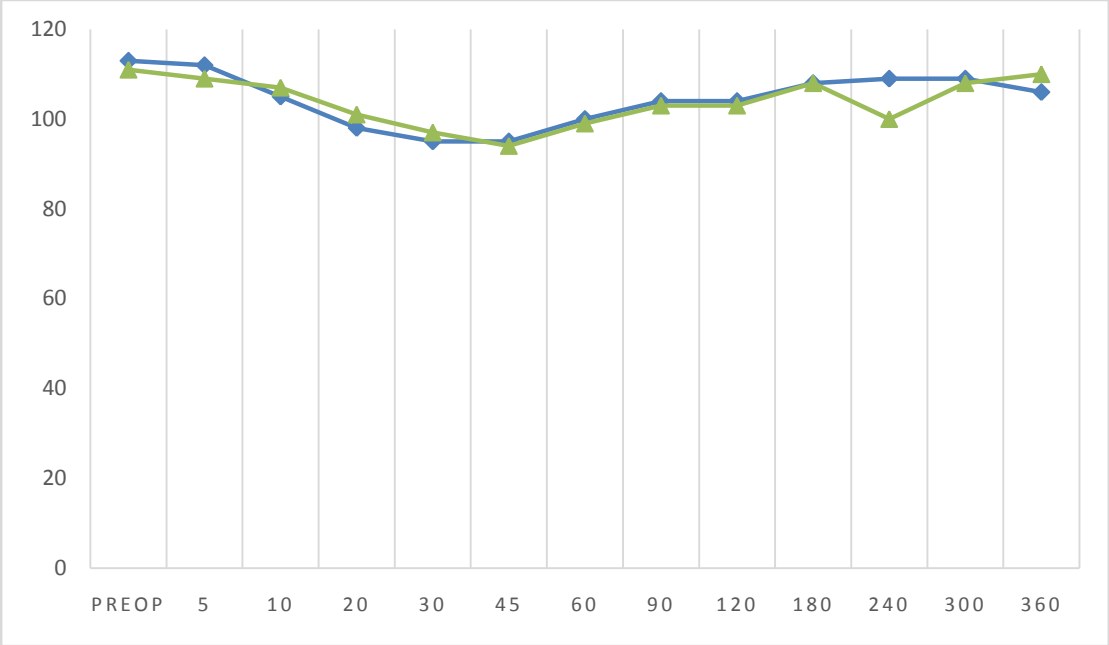
In Group B, the volume of LA used was 67 +/- 8.036 ml and in Group R , was 75.40 +/- 4.311 ml.

The volume of local anaesthetic required in epidural labour analgesia between the two groups was statistically significant (p = 0.00)

HAEMODYNAMIC PARAMETERS

Graph 10

Mean Heart Rate

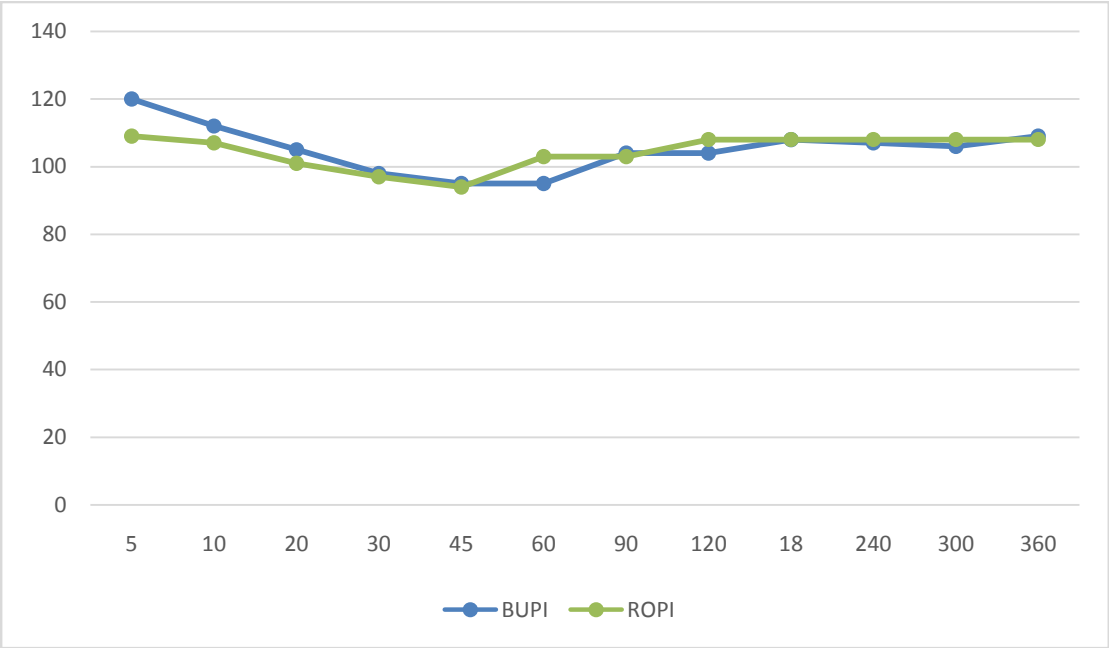


The Graph 10 shows the mean heart rate in both the groups.

The differences in the mean heart rate between the two groups were found to be statistically insignificant.

Graph 11

Mean Systolic Blood Pressure

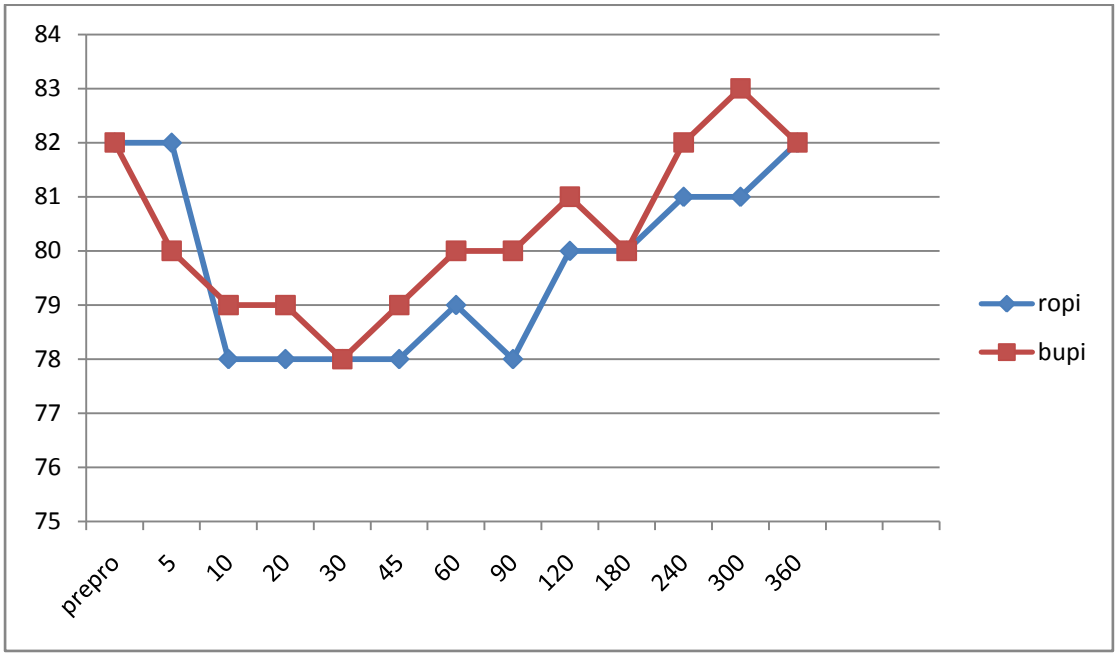


The Graph 11 shows the mean systolic blood pressure of patients in both the groups.

The differences in the mean systolic blood pressure between the two groups were found to be statistically insignificant

Graph 12

Mean Diastolic Blood Pressure



The Graph 12 shows the mean diastolic blood pressure in both the groups.

The differences in the mean diastolic blood pressure between the two groups were found to be statistically insignificant

Graph 13

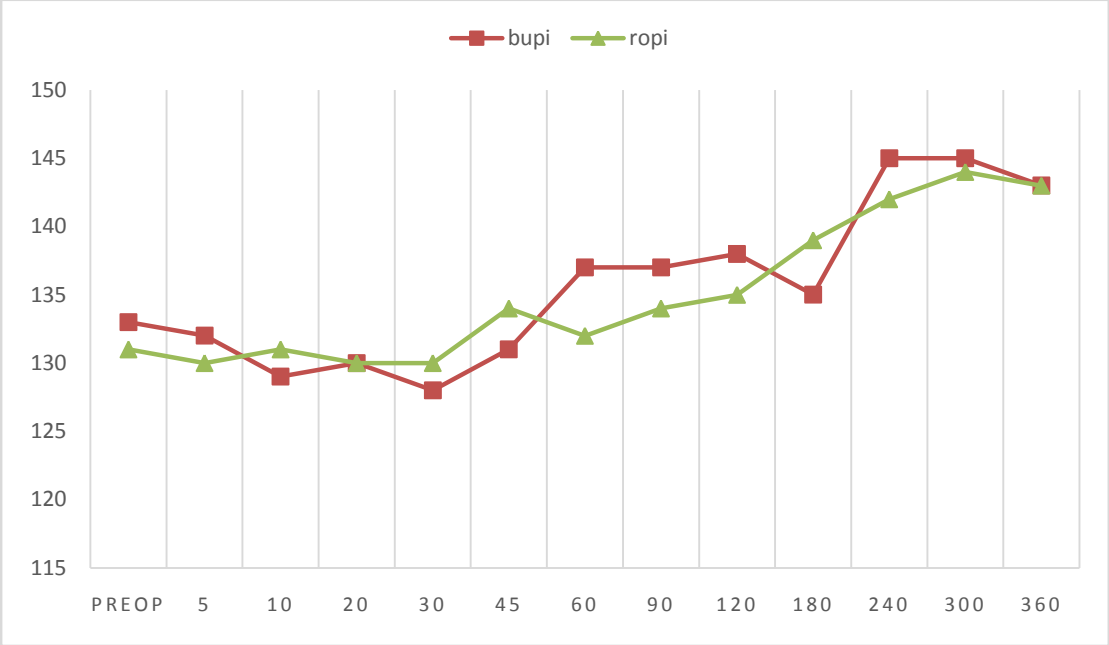
Mean Arterial Pressure

The graph 13 shows the mean arterial pressure in both the groups.

The differences in the mean blood pressure between the two groups were found to be statistically insignificant

Graph 14

Fetal Heart Rate (bpm)

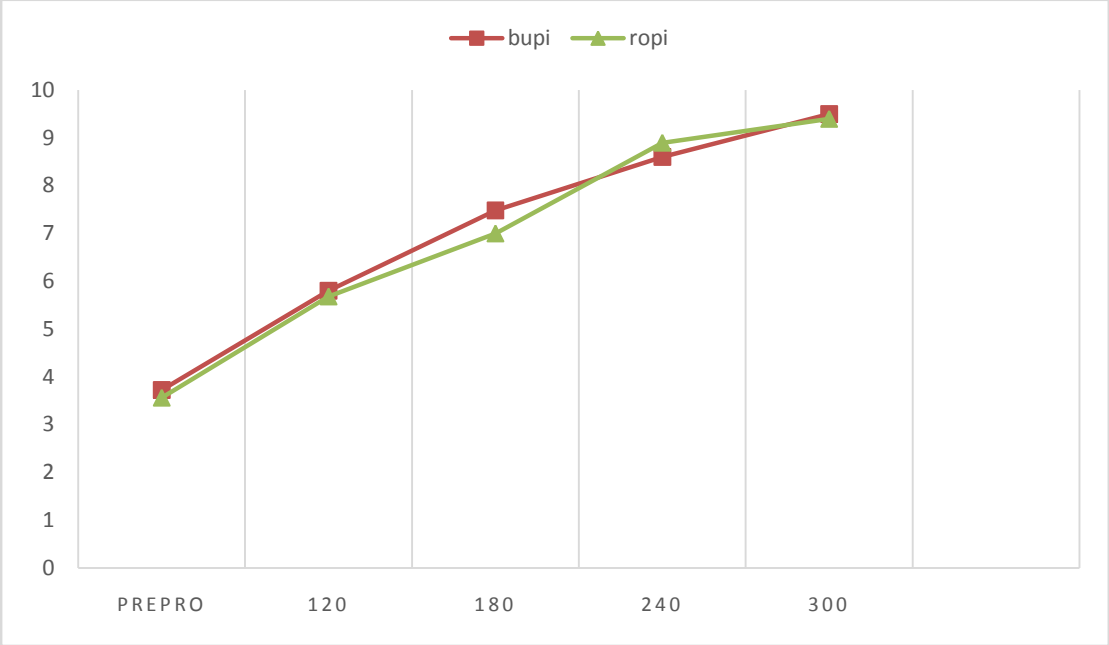


The graph 14 shows the fetal heart rate in both the groups.

The differences in the fetal heart rate between the two groups were found to be statistically insignificant

Graph 15

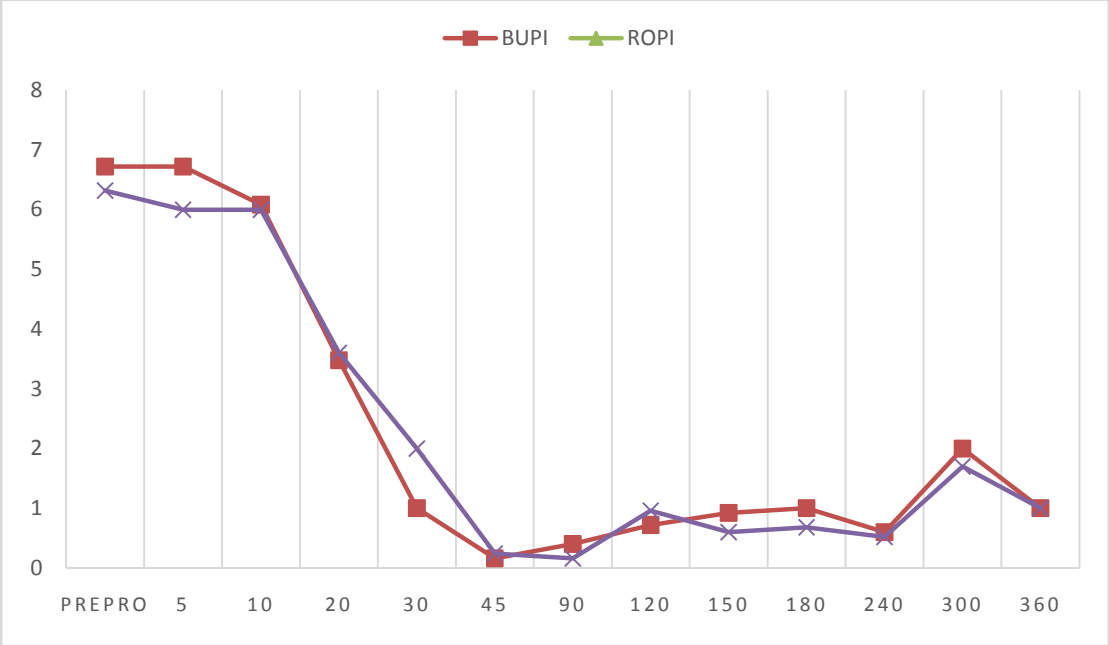
Cervical Dilatation



The graph 15 shows the cervical dilatation between groups 1 and 2 which was comparable between the two groups (p = 0.074)

Graph 16

Visual Analogue Score



The graph 16 shows the visual analogue score between the two groups which was comparable between the groups (p = 0.174)

Discussion

DISCUSSION

In this study, 0.1 % bupivacaine and 2 mcg fentanyl with 0.1 % ropivacaine and 2mcg/ml fentanyl were compared for labour analgesia with regard to analgesic efficacy, onset of action, total dose of local anaesthetic required , intensity of motor blockade ,maternal satisfaction, neonatal outcome and pain score in 50 patients by randomizing them into one of the two groups, the Bupivacaine (B) with Fentanyl and the Ropivacaine (R) group with Fentanyl.

The results obtained were analysed with SPSS (Statistical Package for Social Sciences) version 13 using student t-test and chi square test.

Demographic parameters

The mean age in Group B was 22.80 +/-1.8 years and in Group R was 23.84 +/- 2.09 years. The differences in mean age between the two groups were statistically insignificant (p=0.066).

The mean weight of the patients was 51.20 +/- 6.75 kg in Group B and 50.32 +/- 5.77 kg in Group R. The differences were found to be statistically insignificant (p=0.623).

The Group B patients had a mean height of 154.08 +/- 5.08 cms and in Group R it was 152.92 +/- 3.39 cms and the differences were found to be statistically insignificant (p=0.347).

The mean BMI of the patients in Group B was 21.52 +/- 2.44 kg/m^2 and in Group R was 21.63 +/- 2.22 $kg/m^2$and the differences were found to be statistically insignificant (p=0.869).

Thus both the groups were comparable with respect to age, weight, height and BMI. This correlated with the previous study by Helene Finegold et al and Robert Gaiser et al where the demographic parameters were comparable.

Onset of action

The time of onset of analgesia in Group 1 was 13.08 +/- 2.019 min when compared to Group 2 which was 15.96 +/-2.051 min sssswhich was statistically significant (p = 0.00).This was due to the less lipid solubility of ropivacaine.

This correlated with the previous study by Helene Finegold et al where onset time was 10.62+/- 4.9 min in Group 1 and 11.3 +/- 4.7 min in Group 2.

Total dose of local anaesthetic required

The total volume of local anaesthetic required in Group 1 was 67.0+/-8.036 when compared to Group 2 was 75.40+/-4.311 which was stastically significant.(p =0.00). Though equi-concentrations were used the requirement of ropivacaine was higher than bupivacaine because ropivacaine is less potent than bupivacaine .

This correlated with the previous study by

(1) Halpen et al where 84.8 +/- 61 ml of 0.125 % bupivacaine required against 87.7+/- 68 ml of 0.1 % ropivacaine and
(2) Meister et al where 102.5+/-82 ml of 0.125% bupivacaine required against 113.0 +/- 43.3 ml of 0.125% ropivacaine

Patient satisfaction score

The patient satisfaction score recorded in Group 1 was 84 % with good analgesia and 16 % with excellent analgesia when compared to group 2 wherein it was 78 % with good analgesia and 22 % with excellent analgesia with p value of 0.306.

This correlated with the study by Steinstra et al with results of Group 1 and 2 recorded with 58% and 64.5 % for excellent analgesia respectively, 42 % and 35.5 % for good analgesia in group 1 and 2 respectively.

Mode of delivery

In group 1 , 92 % delivery was spontaneous and 8 % instrumental when compared to group 2 where it was 88 % of spontaneous and 12 % with instrumental delivery(p = 0.637).The rate of spontaneous delivery was higher due to the usage of lower concentrations of both the drugs

The spontaneous vaginal delivery rate was lower in Girard et al with 33 % and 50 % in Chen et al .The rate of spontaneous vaginal delivery in both the groups were lower due to the usage of higher concentrations of bupivacaine(0.125%).

Neonatal outcome

The APGAR score in Group 1 was 8.48+/- 0.51 when compared to 8.52+/-0.51 in Group 2 (p =0.783). This was due to less transfer of both the drugs to fetus as their F/M ratio is around 0.33.

This correlated with Robert Gaiser et al wherein APGAR > 7 was 100% in group 1 versus 97% in group 2.

Duration of First stage of labour

The mean duration of first stage of labour was 216.60 +/- 30.32 in Group B and 210.52 +/- 20.88 in Group R and the differences were found statistically insignificant (p= 0.413).

This correlated with the previous study by Jaime Fernandez et al wherein there was no prolongation of first stage of labour between Group B – 401+/- 184 min and Group R – 365 +/- 186 min with no statistical significance.

Duration of Second stage of labour

The mean duration of second stage of labour was 18.32+/-5.70 in Group B and 27.72+/-5.47 in Group R and the differences were found statistically significant (p=0.00)

The results had no correlation with the previous study conducted by Jaime Fernandez et al wherein the duration of second stage of labour was 57+/- 47 min in Group B and 47 +/- 38 in Group R which was comparable between groups.

Haemodynamic parameters

The differences in the mean heart rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure, oxygen saturation and fetal heart rate were comparable between both the groups .

The hemodynamic parameters correlated with the previous study by Pirdubak et al and Fernandez et al were there was no statistical significance in hemodynamic parameters between the groups.

Conclusion

CONCLUSION

With the observations from the present study, it is concluded that

1. Bupivacaine 0.1% with 2 mcg/ml Fentanyl and Ropivacaine 0.1% with 2 mcg/ml Fentanyl produced equivalent analgesia for labour without compromising fetal outcome and maternal safety.
2. Ropivacaine produced minimal motor blockade when compared to Bupivacaine.
3. The total local anaesthetic requirement was higher with Ropivacaine when compared to Bupivacaine.

Summary

SUMMARY

To summarise, an ideal labour analgesia should provide adequate pain relief with minimal effects on progress and outcome of labour, minimal effects on mother, fetus and newborn and haemodynamic alterations.

The comparative study of 0.1 % Bupivacaine and 2mcg/ml Fentanyl with 0.1 % Ropivacaine and 2 mcg/ml Fentanyl in epidural labour analgesia, conducted on 50 patients showed that both Bupivacaine and Ropivacaine are equivalent with respect to hemodynamic parameters, maternal satisfaction, neonatal outcome and analgesic efficacy.

However the level of motor blockade was minimal with Ropivacaine and volume of total local anaesthetic required was higher with Ropivacaine. The onset of analgesia was little faster with Bupivacaine.

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Annexures

MONITORING CHART

PARAMETER	0 min	5 min	10 min	20 min	30 min	45 min	60 min	90 min	120 min	150 min	180 min
Heart rate (bpm)											
SBP mm Hg											
DBP mm Hg											
MAP mm Hg											
SPO2 %											
FHR (bpm)											

PARAMETER	20 min	30 min	60 min	90 min	120 min	150 min	180 min
Visual analogue scale							
Highest sensory level							
Degree of motor block							

PARAMETER	1st HOUR	2nd HOUR	3rd HOUR
Number of additional supplements			
Total dose of local anaesthetic used			

After delivery

TOTAL DURATION OF FIRST STAGE:

TOTAL DURATION OF SECOND STAGE:

TOTAL DURATION OF THIRD STAGE:

APGAR SCORE:

PATIENT SATISFACTION: Excellent/Good/Fair/Poor

MODE OF DELIVERY: Spontaneous Vaginal / Instrumental vaginal / Caesarean section

GRAND TOTAL OF LOCAL ANAESTHETIC USED:

PROFORMA

NAME : AGE : SEX :

HEIGHT : WEIGHT :

BMI : ASA PHYSICAL STATUS :

ADDRESS :

OP/IP.NO : DOA : DOD :

INFORMED CONSENT:

GROUP : BUPIVACAINE (B) / ROPVACAINE (R)

HISTORY :

General Examination:

Vital signs :

PR: /min BP: / mm Hg RR: /min Temp:

SPo2: %

SYSTEMIC EXAMINATION:

CVS : CNS :

RS : ABD :

INVESTIGATIONS:

Haemoglobin :

Coagulation profile :

Blood sugar :

Blood group :

Urine analysis :

PRELOADING

ஒப்புதல் படிவம்

தலைப்பு : எப்பிடியூரல் கெத்திட்டர் மூலம் பிரசவ வலியை நீக்க பூப்புவிக்கேன் 0.1% + பெண்டனில் 2 mcg/ml அல்லது ரோப்புவிக்கேன் 0.1% + பெண்டனில் 2 mcg/ml செலுத்துதல்

பங்கு பெறுபவர் பெயர் :

பரிசோதனை செய்யுமிடம் :

பாசோதனை எண் :

நோயாளி எண். :

1. நான் இப்பரிசோதனையின் தகவல் படிவம் ..... தேதியிட்ட படிவத்தை படித்து புரிந்து கொண்டேன் என உறுதியளிக்கிறேன். அதில் உள்ள சந்தேகங்களை நிவர்த்தி செய்யும் வாய்ப்பு அளிக்கப்பட்டேன்.
2. என்னுடைய பங்களிப்பு சுய விருப்பத்தின் பேரில்தான் என்பதையும், இதிலிருந்து எந்நிலையிலும் காரணம் தெரிவிக்காமல் விலகிக் கொள்ளவும் எனக்கு உரிமை உள்ளதையும் அறிந்து கொண்டேன். இது என்னுடைய மருத்துவ சிகிச்சையை எந்த விதத்திலும் பாதிப்பு ஏற்படுத்தாது என உணர்ந்து கொண்டேன்.
3. என்னுடைய பரிசோதனை முடிவுகளை எப்பொழுது வேண்டுமானாலும் பயன்படுத்திக் கொள்ள இச்சோதனை அதிகாரிகளுக்கு முழு உரிமை அளிக்கிறேன்.
4. இதன் மூலம் நான் இச்சோதனையில் பங்குபெற முழு சம்மதம் அளிக்கிறேன்.

நோயாளியின் கையொப்பம் :

உறவினர் கையொப்பம் :

பரிசோதனையாளர் கையொப்பம் :

MASTER CHART

NAME	AGE	GROUP	height	weight	BMI	PR_PRE	SBP_PRE	DBP_PRE	MAP_PRE	SpO2_PRE	FHR_PRE	VAS_PRE	cervical_dilation_pre	PR_5	SBP_5	DBP_5	MAP_5	SpO2_5	FHR_5	VAS_5	PR_10	SBP_10	DBP_10	MAP_10	SpO2_10	FHR_10	VAS_10	SEN_10	MOT_10	PR_20	SBP_20	DBP_20	MAP_20	SpO2_20	FHR_20	VAS_20	SEN_20	MOT_20	onset_time	PR_30	SBP_30	DBP_30	MAP_30	SpO2_30	FHR_30	VAS_30	SEN_30	MOT_30	PR_45
LALITHA	22	1	150	40	17.8	128	136	88	104	100	136	6	6	121	130	86	101	100	136	6	120	128	76	93	100	128	6	0	0	115	116	78	91	100	130	2	1	0	12	108	110	76	87	100	116	2	1	0	116
SUDHA	21	1	150	46	20.4	124	124	86	98	100	138	8	4	120	130	88	102	100	146	8	116	120	82	94	99	124	6	0	0	126	136	90	105	100	128	3	12	0	15	124	130	86	100	100	134	2	11	0	110
GUNA	25	1	150	52	23.7	138	138	92	107	100	146	6	4	136	134	90	104	99	138	6	128	120	82	99	100	140	6	0	0	120	112	78	89	100	126	2	10	1	12	106	107	76	86	100	119	0	8	1	98
SATHYA	22	1	152	55	23.9	135	136	94	108	100	136	6	2	128	130	86	100	100	130	6	108	126	86	99	99	118	6	0	0	97	110	78	89	100	108	4	12	0	16	84	106	72	83	100	116	2	10	1	88
KAVIYA	21	1	150	45	20	108	134	86	102	100	136	8	2	110	130	84	99	100	124	8	106	116	80	92	100	120	6	12	0	100	110	78	87	100	130	3	10	0	13	96	112	78	89	99	130	0	10	1	90
LAXMI	24	1	156	60	24.6	136	130	98	107	100	140	6	4	129	128	90	103	100	134	6	125	119	84	96	100	128	6	0	0	118	124	86	99	100	132	4	12	0	15	101	116	76	89	99	118	1	10	1	96
NANDHINI	23	1	150	50	22.2	130	130	80	97	99	132	8	4	131	124	76	92	100	110	8	124	117	78	91	100	115	8	0	0	108	110	70	83	100	120	6	12	0	18	97	116	74	88	100	118	2	10	0	88
LATHA	20	1	154	55	23.2	98	118	78	91	99	128	6	4	110	124	80	94	100	134	6	124	120	86	97	100	146	6	0	0	106	110	84	100	100	118	3	12	0	13	104	100	76	84	100	128	2	11	0	96
ARCHANA	22	1	161	40	15.4	86	110	72	84	100	136	6	2	108	112	78	89	99	130	6	124	118	84	95	100	142	4	0	0	100	120	80	93	100	138	2	12	0	12	96	104	72	82	100	128	0	9	0	80
UMA	24	1	162	65	24.8	110	110	70	83	100	124	8	3	106	124	86	98	100	136	8	98	130	80	96	100	138	6	0	0	90	116	78	90	100	142	4	12	0	12	94	100	70	80	99	128	2	10	0	96
SANKARI	23	1	157	50	20.3	96	116	78	90	100	130	6	4	100	110	72	84	100	142	6	95	106	75	85	99	138	6	0	0	90	112	82	95	100	132	3	12	0	13	96	126	78	94	100	136	2	10	1	102
SUNDHARI	20	1	154	52	21.9	124	128	82	97	100	132	8	4	108	110	78	88	99	139	8	100	108	70	82	100	126	8	0	0	92	112	74	86	100	128	6	12	0	15	86	120	86	97	100	128	2	10	1	90
MALA	22	1	164	53	19.8	98	110	78	88	100	136	6	3	105	16	82	93	100	130	6	96	106	80	88	99	138	6	0	0	90	100	76	84	100	120	2	10	0	10	92	108	82	91	100	129	0	10	1	99
BANU	23	1	165	57	20.9	118	110	86	97	100	132	8	3	110	116	80	92	100	130	8	102	110	78	88	100	126	8	0	0	94	104	76	85	100	134	6	12	0	16	86	108	82	90	99	142	2	10	0	92
PREMA	24	1	150	50	22.2	104	110	82	94	100	126	6	2	110	112	78	89	100	132	6	96	124	80	94	100	138	6	0	0	90	116	82	93	100	135	3	12	0	12	98	120	84	96	98	142	2	10	0	102
MANJULA	26	1	150	44	19.5	110	110	80	90	100	122	8	4	96	116	78	90	100	128	8	90	112	76	88	99	130	8	0	0	84	124	80	94	100	136	4	12	0	13	92	118	82	94	100	130	2	10	1	94
GEETHA	22	1	150	49	21.8	92	124	86	98	100	134	6	4	88	120	78	92	100	146	6	80	118	82	94	100	118	4	12	0	86	112	86	98	99	140	0	10	1	10	90	110	76	87	100	126	0	8	1	88
KOWSALYA	25	1	150	55	24.4	124	130	86	100	100	138	4	4	136	124	80	94	99	130	4	116	118	78	91	100	124	4	0	0	108	112	80	90	100	136	2	12	0	11	98	110	76	87	100	128	0	10	1	102
ARTHI	23	1	150	51	20.2	106	124	86	98	100	132	6	3	100	130	80	96	99	136	6	96	120	82	94	100	128	6	0	0	84	122	78	92	100	120	4	12	0	12	96	110	76	87	100	130	2	10	1	98
SALEEMA	21	1	151	38	17.3	130	110	76	87	100	138	6	6	110	116	83	92	100	124	6	98	100	78	85	100	128	6	0	0	90	110	86	94	100	136	4	1	0	13	84	108	80	89	100	122	4	11	0	90
SOUNDARYA	20	1	158	56	22.4	108	116	84	94	99	124	6	5	110	110	80	90	100	130	6	96	108	76	86	100	136	6	0	0	90	110	80	90	100	128	4	12	0	12	98	116	84	94	100	138	0	10	1	92
DEEPA	22	1	162	61	23.2	108	124	80	94	99	136	8	4	116	110	78	88	99	124	8	104	116	82	93	100	130	6	0	0	98	110	70	83	100	138	6	0	0	16	90	112	86	98	100	126	2	12	0	96
RADHA	24	1	150	46	20.4	88	110	84	92	99	136	8	4	90	112	80	90	100	128	8	82	106	78	87	100	120	6	0	0	78	100	80	86	100	146	4	12	0	13	84	110	80	90	100	140	2	10	0	92
SHAKILA	25	1	154	58	24.5	108	118	82	94	99	126	6	4	116	110	80	90	100	132	6	102	106	76	86	100	130	6	0	0	98	110	78	88	100	142	2	12	0	11	90	104	75	85	100	136	0	10	1	96
PARIMALA	26	1	152	52	23.3	136	118	78	91	99	146	8	4	122	110	72	84	100	140	8	106	108	76	86	100	132	6	0	0	98	116	80	92	100	126	4	12	0	12	90	112	82	92	100	112	0	10	1	96
seetha	27	2	156	60	24.7	124	124	80	94	99	138	8	4	112	130	86	100	100	142	8	106	120	78	92	99	130	8	0	0	108	118	70	86	100	126	6	0	0	20	96	110	76	87	100	116	2	10	0	92
vidhya	22	2	155	52	21.6	106	130	86	100	100	128	6	4	110	124	80	94	100	136	6	102	116	78	90	99	142	6	0	0	96	120	82	94	100	120	4	12	0	16	90	110	70	83	100	130	0	10	0	84
seema	23	2	150	45	22.2	108	136	88	104	100	128	6	3	100	130	80	96	100	134	6	98	134	78	96	99	140	6	0	0	90	126	82	96	100	132	2	12	0	14	92	120	78	92	99	118	0	10	0	99
vanitha	26	2	151	43	18.8	116	124	82	96	100	148	6	3	105	130	86	100	100	130	6	100	124	80	92	100	126	6	0	0	98	118	78	91	99	118	2	10	0	14	90	126	82	96	100	124	0	8	0	96
mariyammal	21	2	150	52	23.1	98	124	88	100	98	126	8	4	106	130	86	100	100	130	8	96	110	78	88	100	138	8	0	0	90	108	72	84	100	120	4	12	0	17	98	110	70	83	100	118	0	10	0	92
sasikala	25	2	150	55	22.9	110	124	82	96	100	136	6	6	100	120	78	92	100	124	6	98	130	86	100	100	130	6	0	0	90	110	70	83	100	130	2	10	0	15	102	108	68	81	100	126	0	10	0	96
veeralaxmi	23	2	151	40	17.5	110	124	80	94	98	128	6	4	124	130	83	100	100	136	6	108	110	80	90	100	125	6	0	0	100	116	78	90	100	115	2	12	0	14	96	116	82	93	98	140	0	10	0	102
divya	21	2	154	55	23.2	110	124	80	94	98	120	6	4	116	110	78	88	100	132	6	108	116	82	93	100	118	6	0	0	100	120	86	97	100	136	4	12	0	15	95	106	70	82	100	143	2	10	0	90
prabha	25	2	153	51	22.2	96	116	80	92	98	122	6	2	102	120	82	94	100	130	6	110	110	78	88	100	138	6	0	0	105	130	86	100	100	138	6	0	0	15	98	110	80	90	100	125	0	10	0	90
madhavi	24	2	158	54	21.6	106	124	80	92	99	136	6	4	110	116	82	93	100	128	6	118	110	78	88	100	120	4	0	0	104	106	70	82	100	130	4	12	0	18	100	115	82	93	100	125	0	10	0	92
baghya	26	2	150	50	22.2	108	124	80	94	99	124	6	4	116	110	78	88	100	136	6	124	106	70	82	100	130	4	0	0	110	112	74	86	100	142	4	1	0	16	102	120	82	94	100	138	2	12	0	96
meenatchi	28	2	150	52	23.1	118	120	80	93	99	132	8	4	106	130	86	100	100	122	8	110	124	78	93	100	130	6	0	0	98	118	70	86	100	136	4	12	0	17	94	110	80	90	100	142	2	10	0	90
kavitha	22	2	153	48	20.5	134	124	86	98	98	122	6	5	126	130	80	96	100	105	6	120	118	78	91	100	136	6	0	0	118	120	82	94	100	142	4	12	0	17	105	110	72	84	100	128	2	10	0	98
maruthayee	20	2	156	60	24.6	118	118	82	94	98	124	8	4	124	110	80	90	100	132	8	108	122	84	96	100	139	8	0	0	112	120	78	92	100	146	6	1	0	22	98	116	86	96	100	118	4	12	0	90
hamsa	23	2	152	46	20	108	130	86	100	99	132	6	4	96	124	80	94	100	146	6	104	118	78	91	100	138	8	0	0	116	122	82	95	100	128	4	12	0	15	92	130	84	99	100	136	0	10	0	86
vani	25	2	150	52	23.1	96	124	80	94	99	138	8	2	104	130	86	100	100	124	8	98	120	80	93	100	138	8	0	0	90	110	76	87	100	146	6	1	0	18	104	126	72	90	100	122	2	10	0	96
sameena	24	2	154	59	24.9	110	136	86	102	98	138	6	4	116	130	80	96	100	126	6	102	124	80	94	100	129	6	0	0	98	120	78	92	100	136	4	12	0	14	105	108	72	84	99	142	2	10	0	96
pothumponnu	26	2	152	52	22.5	108	132	78	96	98	128	6	2	116	130	84	101	100	136	6	100	126	72	90	100	142	6	0	0	98	120	76	88	100	122	4	1	0	15	90	118	70	86	99	138	2	12	0	96
geetha	25	2	150	43	19.1	124	124	80	94	100	138	6	4	108	130	86	100	100	130	6	116	110	78	88	100	126	6	0	0	102	116	82	95	100	142	2	12	0	15	95	120	84	96	100	122	0	10	0	90
udhaya	23	2	150	40	17.8	110	126	88	100	98	130	8	4	118	130	80	96	100	125	8	124	124	72	97	100	118	6	0	0	108	120	78	92	100	126	4	1	0	16	96	126	84	98	100	134	2	12	0	102
sujatha	21	2	153	51	21.8	110	130	84	99	99	138	6	4	102	136	86	102	100	124	6	108	124	88	100	100	130	6	0	0	108	124	88	100	100	130	6	0	0	18	96	120	80	93	100	146	4	12	0	92
priya	22	2	153	48	22.5	124	130	86	100	98	126	6	3	110	124	80	94	100	138	6	118	110	78	88	100	144	6	0	0	106	110	76	87	100	130	4	12	0	15	112	124	86	98	100	136	0	10	0	108
shakira	25	2	163	44	16.6	108	124	82	96	98	145	4	2	104	120	86	97	100	130	4	98	128	78	94	100	136	4	0	0	90	132	84	100	100	124	0	10	0	13	106	130	80	96	100	128	0	8	0	100
fareeda	26	2	150	49	21.7	106	124	78	93	97	122	4	3	110	130	82	98	99	136	4	115	130	86	100	100	130	4	0	0	106	128	78	94	100	142	2	10	0	15	98	124	82	96	100	138	0	10	0	102
manimegalai	23	2	159	57	22.6	110	120	80	93	98	134	6	2	106	124	86	98	100	136	6	105	130	78	95	100	142	4	0	0	98	132	84	100	100	128	2	12	0	15	96	128	86	100	100	136	0	10	0	90

SBP_45	DBP_45	MAP_45	SpO2_45	FHR_45	VAS_45	SEN_45	MOT_45	PR_60	SBP_60	DBP_60	MAP_60	SpO2_60	FHR_60	VAS_60	SEN_60	MOT_60	ADDL_DOSE_1HR	TOTAL_DOSE_1HR	PR_90	SBP_90	DBP_90	MAP_90	SpO2_90	FHR_90	VAS_90	SEN_90	MOT_90	PR_120	SBP_120	DBP_120	MAP_120	SpO2_120	FHR_120	cervical_dilation_120	VAS_120	SEN_120	MOT_120	ADDL_DOSE_2HR	TOTAL_DOSE_2HR	PR_150	SBP_150	DBP_150	MAP_150	SpO2_150	FHR_150	VAS_150	SEN_150	MOT_150	PR_180	SBP_180	DBP_180
120	84	96	100	132	0	2	0	112	126	90	102	100	138	0	2	0	0	15	120	132	88	103	100	124	0	10	0	128	136	90	105	100	128	8	2	10	0	15	15	136	140	96	111	100	142	0	2	0	130	124	86
124	80	94	100	110	2	10	0	102	110	78	88	100	124	0	8	0	20	20	94	100	80	86	100	128	0	10	0	108	110	84	92	99	136	6	1	11	0	15	15	106	110	84	92	100	134	0	11	0	122	128	82
120	78	92	99	124	0	8	1	88	110	76	87	100	130	0	10	0	0	15	96	116	78	91	100	128	0	11	0	94	112	84	93	100	138	6	2	10	0	20	20	90	118	86	97	100	146	2	10	0	106	110	84
116	80	92	100	124	0	10	1	83	109	76	87	100	128	2	11	0	15	15	98	124	80	95	100	138	0	10	1	114	126	82	97	99	126	6	2	10	0	15	15	100	110	86	94	100	128	0	10	1	108	118	78
110	70	83	100	116	0	8	1	104	118	80	92	100	146	2	10	0	15	15	92	112	82	92	100	124	0	10	1	94	116	78	90	100	138	4	0	10	0	10	10	108	124	86	98	100	150	2	12	0	98	120	72
109	70	83	100	124	0	10	1	89	113	74	87	100	117	0	10	1	15	15	92	106	78	87	100	108	0	8	1	87	110	72	85	100	125	6	2	10	1	15	15	90	116	70	85	99	134	2	10	0	108	118	78
100	70	80	100	123	2	10	1	94	121	78	92	100	117	0	8	1	15	15	99	115	82	93	100	125	0	10	1	92	118	76	90	100	136	6	2	10	0	15	15	108	128	86	100	100	128	0	10	1	112	130	80
116	82	93	100	136	0	10	1	102	118	80	92	100	148	0	8	1	20	20	128	130	88	102	100	156	2	10	0	132	136	92	106	100	150	6	2	10	1	20	20	108	122	80	94	99	132	0	8	1	100	120	78
110	78	88	100	118	0	8	1	92	116	82	93	100	126	0	8	1	15	15	106	124	86	98	100	132	2	10	1	124	130	88	102	100	140	4	0	8	1	10	10	109	122	82	95	100	130	1	10	1	112	110	76
110	74	86	100	138	0	8	1	84	106	78	86	100	136	0	10	1	20	20	90	106	70	81	100	140	0	10	1	109	124	86	98	100	134	5	2	12	0	10	10	116	130	80	96	100	154	1	12	0	124	134	88
130	84	99	100	156	0	8	1	110	132	80	97	100	158	0	10	1	15	15	106	122	80	94	100	148	0	2	1	94	108	84	94	100	140	6	0	9	0	15	15	88	115	78	90	100	136	1	12	0	94	110	84
118	82	94	100	134	0	8	1	102	110	80	90	100	142	0	8	1	15	15	118	134	86	102	100	148	0	8	1	100	124	80	94	100	156	6	0	10	0	20	20	124	115	76	89	100	137	0	10	0	114	110	72
116	86	96	100	139	0	8	1	106	120	78	94	100	146	0	8	1	15	15	110	124	88	100	100	152	0	10	1	95	118	82	94	100	148	5	2	10	0	15	15	116	130	89	100	100	140	2	10	0	112	128	88
114	78	90	100	138	0	10	1	99	120	80	93	100	146	0	10	1	15	15	110	126	86	99	100	156	0	10	1	104	118	86	97	100	150	6	0	10	1	20	20	98	110	80	90	100	142	2	10	0	102	124	82
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116	80	92	98	130	0	8	1	99	110	84	92	100	136	2	10	0	15	15	110	120	86	97	100	160	2	10	0	102	124	90	101	100	132	6	0	10	1	10	10	100	108	82	90	100	126	0	8	1	110	110	78
116	84	94	99	139	0	10	1	110	124	90	101	100	146	2	12	0	15	15	105	16	86	96	100	150	2	10	0	110	110	80	90	100	138	6	0	10	1	20	20	118	120	84	96	100	140	0	10	1	106	115	75
116	84	94	100	146	0	8	1	110	120	88	98	100	140	0	10	0	15	15	102	110	70	83	99	152	2	12	0	94	124	86	98	100	128	5	2	10	0	15	15	98	116	78	90	100	130	0	10	0	106	108	84
120	84	96	100	130	0	10	1	100	118	82	94	100	142	0	8	1	20	20	92	124	86	98	100	150	2	10	0	104	110	70	83	100	162	8	0	10	0	15	15	96	116	78	90	100	158	0	10	0	110	124	88
110	82	91	100	144	0	10	1	104	124	86	98	100	152	2	12	0	15	15	110	122	78	92	100	140	0	10	1	98	118	80	92	100	148	7	0	8	1	20	20	106	130	86	100	100	126	0	10	1	110	116	78
108	76	86	100	132	0	10	1	102	120	88	98	100	118	0	10	1	20	20	110	30	86	100	99	126	2	10	1	98	116	80	92	100	124	7	0	10	1	20	20	104	114	78	90	100	140	2	10	0	110	124	82
116	72	86	100	135	0	8	1	106	124	86	98	100	138	0	10	1	20	20	98	130	82	98	100	125	1	10	1	100	118	86	97	100	132	6	0	10	1	15	15	102	110	70	83	100	140	0	10	1	96	116	78
116	80	92	100	122	0	8	1	106	124	86	98	100	148	0	10	1	20	20	98	120	78	92	100	116	1	10	0	108	128	86	100	99	138	6	0	10	1	15	15	110	108	70	82	99	124	1	10	0	104	115	75
120	86	97	100	124	0	8	1	104	130	84	99	100	138	0	10	1	15	15	116	124	75	91	100	125	0	10	1	102	110	80	90	100	148	6	2	10	0	20	20	112	115	78	90	100	140	0	10	1	100	110	82
114	78	90	100	130	0	10	0	98	120	82	94	100	140	0	8	0	15	15	104	126	76	92	100	136	2	12	0	106	130	82	98	100	124	6	0	10	0	20	20	110	106	70	82	100	128	0	10	0	108	112	78
112	76	88	100	148	0	10	0	92	120	82	94	100	112	1	10	0	20	20	98	126	78	94	100	126	2	10	0	94	130	80	96	100	132	6	0	10	0	20	20	100	140	90	106	100	156	2	12	0	106	132	82
110	78	88	100	134	0	8	0	86	104	70	81	100	123	0	10	0	20	20	104	122	80	94	99	142	2	10	0	96	126	84	98	100	134	6	0	10	0	20	20	90	120	86	97	100	138	0	10	0	95	128	80
120	76	90	100	138	0	8	0	106	132	80	97	100	142	1	10	0	15	15	110	128	72	90	98	130	2	10	0	98	106	70	82	100	152	5	0	10	0	20	20	104	114	76	88	100	144	1	12	0	112	120	78
130	78	95	100	124	0	10	0	100	126	72	90	100	132	0	8	0	15	15	106	120	80	93	100	146	2	10	0	102	124	82	96	100	140	6	0	10	0	20	20	99	134	84	99	100	134	2	10	0	110	122	75
112	74	86	100	142	0	10	0	110	120	80	93	100	130	0	10	0	20	20	102	122	84	96	100	135	2	12	0	94	136	78	97	100	142	8	0	10	0	20	20	106	124	84	97	100	152	2	10	0	112	130	82
124	82	96	100	138	0	10	0	98	108	76	86	100	146	0	8	0	15	15	90	112	80	90	100	150	2	10	0	102	124	84	97	100	142	6	2	12	0	20	20	110	120	78	92	100	132	0	10	0	126	132	82
116	78	90	100	130	2	10	0	98	130	86	100	100	125	2	10	0	20	20	105	138	82	100	100	132	0	8	0	120	118	75	89	100	140	6	0	8	0	15	15	116	110	76	87	100	128	0	10	0	106	118	82
105	75	85	100	132	0	8	0	100	110	82	91	100	130	0	8	0	15	15	106	118	78	91	100	140	2	10	0	101	109	80	89	100	136	4	0	10	0	20	20	96	120	84	96	100	128	0	8	0	104	126	80
120	84	96	100	116	0	8	0	96	130	86	100	100	132	0	8	0	15	15	99	126	78	94	100	156	2	10	0	105	132	86	101	100	138	6	0	10	0	20	20	112	118	82	94	100	140	0	10	0	106	110	76
134	86	102	100	156	0	10	0	90	128	90	102	100	130	0	10	0	20	20	106	132	78	96	100	118	0	8	0	100	136	84	102	100	125	6	0	10	0	15	15	116	140	90	106	100	130	0	10	0	104	130	88
10	72	83	100	130	0	0	0	108	106	70	82	100	128	0	8	0	15	15	116	128	78	94	100	116	0	10	0	102	122	82	95	100	129	6	0	10	0	20	20	106	130	76	94	100	135	1	10	0	110	136	82
106	78	87	100	132	0	10	0	110	116	86	96	100	148	0	8	0	20	20	105	122	2	88	100	118	2	10	0	115	130	82	98	100	126	7	0	10	0	20	20	122	126	78	94	100	132	2	12	0	105	130	86
124	80	94	100	128	2	10	0	106	130	86	100	100	136	0	10	0	20	20	100	104	65	78	100	145	0	10	0	96	110	72	84	99	140	6	0	10	0	15	15	102	124	80	94	100	134	2	12	0	116	126	82
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130	84	99	100	136	0	10	0	98	110	70	83	100	132	0	8	0	20	20	102	105	65	78	100	125	0	8	0	120	116	78	90	100	156	4	2	10	0	15	15	118	124	88	100	100	144	2	12	0	105	110	72
100	65	76	100	125	0	10	0	100	110	74	86	100	120	0	8	0	20	20	116	116	80	92	100	134	0	8	0	104	122	82	95	100	126	6	0	10	0	15	15	98	130	86	100	100	124	2	12	0	106	118	76
109	68	81	100	146	0	10	0	102	112	74	86	100	130	0	10	0	20	20	110	116	70	85	100	126	0	8	0	104	128	76	93	100	118	4	1	10	0	15	15	122	134	82	99	100	126	0	10	0	105	122	80
112	70	84	100	134	0	10	0	96	108	68	81	99	128	0	10	0	20	20	100	110	72	84	100	136	2	12	0	110	119	78	91	100	146	6	0	10	0	15	15	103	124	86	98	100	124	2	12	0	114	130	88
138	88	104	100	134	0	10	0	114	132	82	98	100	132	0	10	0	20	20	105	126	78	94	100	125	0	8	0	118	120	80	93	100	131	6	2	10	0	20	20	100	134	86	102	100	139	2	12	0	96	126	88
118	78	91	100	140	2	10	0	98	110	68	82	100	136	0	10	0	15	15	104	119	76	90	100	142	0	10	0	98	122	80	94	100	126	6	2	12	0	20	20	90	110	84	96	100	136	0	10	0	96	116	78
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126	84	98	100	132	0	8	0	96	122	76	91	100	128	0	8	0	15	15	90	126	82	96	99	120	0	10	0	94	120	88	98	100	134	4	2	12	0	20	20	98	124	82	96	100	142	2	10	0	100	130	80
130	86	100	100	135	0	8	0	94	124	78	93	100	142	0	8	0	20	20	90	110	82	91	100	128	0	10	0	92	116	78	90	100	130	5	1	10	0	15	15	106	122	80	94	100	138	0	12	0	110	124	76
120	78	82	99	136	0	10	0	98	128	75	92	100	148	0	8	0	20	20	102	110	70	83	100	156	0	8	0	108	124	82	96	100	150	6	1	12	0	15	15	110	126	65	86	100	140	0	10	0	115	110	78

MAP_180	SpO2_180	FHR_180	cervical_dilation_180	VAS_180	SEN_180	MOT_180	ADDL_DOSE_3HR	TOTAL_DOSE_3HR	PR_210	SBP_210	DBP_210	MAP_210	SpO2_210	FHR_210	VAS_210	SEN_210	MOT_210	PR_240	SBP_240	DBP_240	MAP_240	SpO2_240	FHR_240	cervical_dilation_240	VAS_240	SEN_240	MOT_240	ADDL_DOSE_4HR	TOTAL_DOSE_4HR	PR_270	SBP_270	DBP_270	MAP_270	SpO2_270	FHR_270	VAS_270	SEN_270	MOT_270	PR_300	SBP_300	DBP_300	MAP_300	SpO2_300	FHR_300	cervical_dilation_300	VAS_300	SEN_300	MOT_300	ADDL_DOSE_5HR	TOTAL_DOSE_5HR	PR_330
100	100	0	0	0	1	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	100	156	8	2	12	1	15	15	116	122	76	91	100	102	2	12	0	0	0	0	0	0	0	0	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	100	140	8	1	10	0	15	15	122	120	80	93	100	138	1	10	0	0	0	0	0	0	0	0	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	100	136	9	2	12	0	15	15	110	120	80	93	100	140	2	10	0	116	130	86	101	100	156	10	0	12	0	20	20	116	138	96	110	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	100	138	6	0	10	0	10	10	108	122	84	96	100	134	2	11	0	112	110	78	88	100	148	9	0	12	0	15	15	116	130	80	100	100	148	3	12	0	0	0	0	0	0	0	0	0	0	0	20	20	0
91	100	129	8	0	12	0	15	15	124	130	86	101	100	146	0	12	0	106	110	76	87	100	0	0	2	12	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	99	130	8	2	12	0	15	15	105	124	76	92	100	124	0	12	0	128	134	86	102	100	0	0	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	100	130	8	0	8	1	10	10	122	118	76	90	100	136	2	10	0	130	124	86	98	100	0	0	0	12	0	20	20	110	120	80	93	100	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	100	124	6	1	11	0	15	15	104	124	86	98	100	128	0	10	1	110	116	78	90	100	142	8	0	10	0	15	15	118	120	76	90	100	156	2	12	0	109	124	86	98	100	145	10	0	0	0	20	20	0
103	100	162	8	0	10	0	15	15	106	110	80	90	100	138	2	12	0	110	112	78	87	100	144	10	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	100	129	8	2	12	0	20	20	110	124	86	98	100	142	0	12	0	116	120	82	94	100	0	0	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	100	125	8	1	12	0	10	10	110	120	80	93	100	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	100	138	7	2	12	0	20	20	105	115	82	93	100	146	2	10	0	110	120	86	97	100	152	10	2	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	100	146	8	2	10	0	10	10	110	130	86	100	100	152	2	12	0	116	128	82	97	100	138	10	2	12	0	20	20	108	110	80	90	98	0	2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	100	140	6	0	10	1	15	15	124	130	90	103	100	136	0	10	1	116	110	82	94	100	142	8	0	10	1	20	20	130	116	78	90	100	156	2	10	0	110	120	84	96	100	0	0	2	12	0	20	20	106
88	100	140	8	1	10	1	15	15	110	126	86	99	100	156	1	12	0	98	110	98	90	100	0	0	0	12	0	20	20	110	116	76	89	100	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	99	160	8	1	10	0	15	15	106	106	84	94	100	0	0	12	0	100	110	80	90	100	0	0	0	12	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	100	146	8	2	10	0	15	15	100	110	70	83	100	150	0	10	0	124	128	78	94	100	156	10	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	99	156	5	1	12	0	20	20	110	124	86	98	100	132	0	12	1	102	18	80	92	100	132	7	0	12	0	20	20	96	110	78	88	100	0	0	12	0	108	110	80	80	100	0	9	0	0	0	0	0	0	0
100	100	146	10	0	12	0	20	20	108	120	76	90	100	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	100	138	9	1	12	0	15	15	116	124	80	94	100	156	0	12	0	100	130	82	98	100	0	0	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	99	152	9	0	12	0	20	20	118	130	86	100	99	168	2	12	0	116	132	78	96	100	0	0	0	12	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	10	123	8	2	12	0	15	15	110	124	82	96	100	137	0	12	0	108	130	86	100	100	0	0	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	100	146	8	2	10	0	15	15	109	122	82	95	100	158	2	12	0	106	130	86	100	100	0	0	0	12	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	100	156	8	0	12	0	20	20	118	114	78	90	100	132	0	12	0	118	114	78	90	100	0	0	0	12	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	99	130	8	0	10	0	20	20	124	120	80	93	100	156	2	12	0	106	134	86	102	100	148	10	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	100	142	8	0	12	0	20	20	110	124	80	94	100	152	0	12	0	108	130	86	100	100	162	10	0	10	0	20	20	106	130	80	95	100	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	100	152	8	2	12	0	15	15	103	130	86	100	100	156	0	12	0	100	132	86	101	100	0	10	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	100	138	7	2	10	0	20	20	108	130	86	100	100	156	0	12	0	116	130	80	96	100	148	10	0	12	0	20	20	108	130	86	100	100	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	100	125	8	2	12	0	20	20	102	126	80	93	100	148	0	12	0	96	10	80	96	100	0	0	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	100	160	10	0	12	0	20	20	124	124	80	94	100	0	0	12	0	0	0	0	0	0	0	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	100	124	8	0	12	0	20	20	100	140	96	110	100	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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100	100	152	9	1	10	0	20	20	110	132	84	100	100	0	0	12	0	95	116	78	90	100	0	0	0	12	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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90	100	148	8	0	10	0	20	20	112	110	80	90	100	156	0	12	0	124	124	86	98	100	138	10	0	12	0	20	20	108	116	84	94	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	100	132	6	0	10	0	15	15	98	128	84	98	100	140	2	12	0	110	130	76	94	100	148	8	0	12	0	20	20	115	126	84	100	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0
102	100	130	8	1	12	0	20	20	110	140	92	108	100	138	0	12	0	118	110	86	100	100	140	0	2	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	100	148	8	0	12	0	20	20	105	136	80	98	100	132	0	10	0	110	120	86	97	100	144	0	0	12	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	100	128	8	1	12	0	15	15	102	110	76	87	100	130	0	12	0	108	124	82	96	100	0	0	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	100	136	7	1	12	0	20	20	108	118	80	92	100	148	0	12	0	102	124	82	96	100	152	10	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	100	140	6	0	10	0	20	20	108	136	80	100	100	146	0	12	0	104	110	74	86	100	148	8	0	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	100	140	7	0	12	0	15	15	108	110	80	90	100	146	0	10	0	110	124	82	96	100	0	10	0	12	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	99	152	8	0	10	0	15	15	124	130	86	100	100	136	2	12	0	120	110	70	83	100	128	10	2	12	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SBP_330	DBP_330	MAP_330	SpO2_330	FHR_330	VAS_330	SEN_330	MOT_330	PR_360	SBP_360	DBP_360	MAP_360	SpO2_360	FHR_360	cervical_dilation_360	VAS_360	SEN_360	MOT_360	ADDL_DOSE_6HR	TOTAL_DOSE_6HR	PR_390	SBP_390	DBP_390	MAP_390	SpO2_390	FHR_390	VAS_390	SEN_390	MOT_390	PR_420	SBP_420	DBP_420	MAP_420	SpO2_420	FHR_420	cervical dilation_420	VAS_420	SEN_420	MOT_420	ADDL_DOSE_7HR	TOTAL_DOSE_7HR	FIRST_STAGE	SECOND_STAGE	THIRD_STAGE	total duration	APGAR	PATIENT_SATISFACTIO N	MODE_OF_DELIVERY	GRAND_TOTAL_LOCAL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	20	5	175	9	2	1	45
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	20	5	225	9	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	190	20	4	214	8	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	225	25	6	256	9	2	1	65
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	270	20	4	294	9	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	25	10	215	8	2	1	60
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	25	8	233	9	1	1	65
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	225	20	5	250	8	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	20	4	304	8	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	230	10	5	245	9	2	1	65
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	215	10	4	229	9	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	15	6	231	8	2	1	65
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	240	18	3	261	9	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	233	15	4	252	8	2	1	65
124	86	98	100	0	2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	270	30	7	307	8	2	2	85
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	220	20	6	246	9	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	15	5	220	8	2	1	50
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	230	20	5	255	9	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	250	20	10	280	8	1	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	20	10	210	9	2	1	55
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	15	7	232	8	1	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	18	5	223	8	2	2	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	215	10	6	231	8	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	192	18	6	216	9	1	1	65
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	18	8	236	8	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	225	25	8	258	9	1	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235	20	7	257	9	1	1	80
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	208	23	7	238	9	1	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	225	30	8	263	8	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	20	6	236	9	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	20	5	205	8	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	25	6	211	9	1	2	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	30	6	236	9	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	265	35	8	308	8	2	2	85
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	190	25	10	225	8	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	220	35	6	261	8	2	1	80
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	205	30	5	240	8	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	25	7	212	8	1	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235	25	7	267	8	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	205	35	8	248	9	1	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235	25	8	268	9	2	2	85
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	215	35	6	256	9	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	230	30	5	265	8	2	1	80
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	190	30	8	228	9	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	185	30	8	223	8	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	25	5	240	9	2	1	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	30	6	246	8	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	220	40	5	265	8	2	1	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	195	25	8	228	9	1	1	65
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	20	5	235	9	2	1	75

KEY TO MASTER CHART

S. No	**:**	**Serial Number**
BMI	**:**	**Body mass index**
PR	**:**	**Pulse rate**
SBP	**:**	**Systolic blood pressure**
DBP	**:**	**Diastolic blood pressure**
MAP	**:**	**Mean blood pressure**
SpO2	**:**	**Oxygen saturation**
FHR	**:**	**Fetal heart rate**
VAS	**:**	**Visual analogue score**
Pre	**:**	**Pre procedure**
SEN	**:**	**Level of sensory blockade**
MOT	**:**	**Level of motor blockade**